M.A.(Geography)

1. When is India going to hold its next census?
A) 2020 B) 2021 C) 2025 D) 2031

2. In which year was survey of India established?
A) 1767 B) 1757 C) 1857 D) 1947

3. Which of the following was the last state formed?
A) Telangana B) Goa C) Jharkhand D) Chhattisgarh

4. The word Geography is derived from?
A) Greek B) Latin C) German D) Arabic

5. The difference of one degree of longitude denotes a time difference of?
A) 4 minutes B) one hour C) 15 minutes D) 30 minutes

6. Ecuador is in:
A) Europe B) South America C) Africa D) Asia

7. The moderating influence of the ocean on air temperature is called the
A) Continental effect B) Maritime Effect
C) Latitudinal effect D) Altitudinal effect

8. Equatorial diameter of earth is
A) 12756 km B) 6350 km C) 12714 km D) 11500 km

9. Isotherms depict
A) Length B) Height
C) Places having equal temperature D) Atmospheric pressure

10. The territorial waters of India extend into the sea to a distance of ---------nautical miles measured from the appropriate base line.
A) 10 B) 12 C) 15 D) 18

11. Standard sea level air pressure is
A) 1000 mb B) 1050mb C) 1013 mb D) 100 mb

12. The deflective force affecting movement on a rotating body is called
A) Frictional Force B) Gravitational Force
C) Coriolis force D) Geostrophic force

13. Which one of the following questions is related to cause-effect relationship?
A) What B) Where C) When D) Why

14. Life on the earth appeared around how many years before the present?
A) 13.7 billion B) 4.6 billion C) 3.8 million D) 3.8 billion

15. Which one of the following has the longest duration?

A) Eons B) Era C) Period D) Epoch

16. Eratosthenes was

A) Greek B) Roman C) Arab D) German

17. Who amongst the following was the first to consider the possibility of Europe, Africa and America having been located side by side?

A) Alfred Wegener B) Edmond Hess

C) Antonio Pellegrini D) Abraham Ortelius

18. When was NITI Aayog formed?

A) Jan 1, 2015 B) Jan 1, 2016 C) Jan 1, 2017 D) Jan 1, 2014

19. What is the capital of Lakshadweep?

A) Panaji B) Kavaratti C) Silvasa D) Diu

20. Which of the following states is the largest producer of Soyabean?

A) Karnataka B) Wes Bengal C) Madhya Pradesh D) Tamil Nadu

21. The tropical cyclone *willy-willies* strikes in :

A) Western Atlantic B) Western North Pacific

C) Australia D) India

22. Read the following statements

(i) The place of origin of earthquake is called focus.

(ii) The point directly above the focus on the earth's surface is called epicenter.

(iii)The Richter scale measures the intensity of the earthquake.

(iv)The Modified Mercalli Scale ranges from I- XII.

Identify the ***incorrect*** statements:

A) (i), and (ii) B) (iii) C) (iii) and (iv) D) (iv)

23. *Bermuda* is

A) North Atlantic's high pressure cell B) North Atlantic's low pressure cell

C) Indian Ocean's high pressure cell D) Indian Ocean's low pressure cell

24. Which of the following is incorrect about weathering?

A) Mechanical weathering is also called physical weathering.

B) Frost action is an example of mechanical weathering.

C) Hydrolysis occurs due to biological weathering

D) Oxidation is a chemical process

25. Weathering is at *in situ*. It means

A) Breaking of rocks at the same site B) Breaking of rocks by water

C) Breaking of rocks by glaciers D) Deposition of rock

26. Davis called the most prominent not yet eroded remnants as:

A) Peneplain B) Monadnocks C) Pediplaines D) Berm

27. Occasionally, two or more sinkholes join to become a larger depression called :
A) Uvala B) Perched acquifer C) Tower D) Swallow hole

28. In which mountain range is the Khyber pass located?
A) Kirthar B) Hindukush C) Dhauladhar D) Sulaiman

29. On the Fahrenheit scale, water boils at:
A) 100 degree F B) 212 degree F C) 32 degree F D) -273.5 degree F

30. Which of the following is **not** a planetary wind?
A) Trade wind B) Westerlies C) Polar winds D) Monsoon

31. Which of the following is incorrectly matched?
A) Kudremukh : Karnataka
B) Bailadila : Chattisgarh
C) Kurnool : Tamil Nadu
D) Panna : Madhya Pradesh

32. Form lines are a type of:
A) Contours B) Hachures C) Spot height D) Bench mark

33. Which of the following tribes is the largest in numerical strength?
A) Bhil B) Santhal C) Gonds D) Meena

34. Which of the following is the second largest state in population?
A) Madhya Pradesh B) Uttar Pradesh
C) Rajasthan D) Maharashtra

35. In which year the Indian States were reorganized on the basis of language?
A) 1947 B) 1952 C) 1956 D) 1961

36. In which state of India is Angul, the largest aluminium plant in Asia located?
A) Gujarat B) Jharkhand C) Odisha D) Chhattisgarh

37. Quartzite is an example of
A) Igneous rock B) Sedimentary rock
C) Primary rock D) Metamorphic rock

38. The point in the earth's orbit when the distance to the sun is maximized occurs in
A) January B) March C) July D) September

39. Which of the following colours has the shortest wavelength?
A) Indigo B) Green C) Blue D) Red

40. Which of the following atmospheric layers has the concentration of ozone?
A) Troposphere B) Stratosphere C) Ionosphere D) Thermosphere

41. Uttarakhand, Uttar Pradesh and Bihar have a common frontier with

A) China B) Bhutan C) Myanmar D) Nepal

42. The bench mark on the map denotes

A) Height of a man made feature B) Distance between mountain tops
C) Width of a river D) Length of a river

43. Equator is a

A) Longitude B) Latitude C) Point D) Meridian

44. Rhumb line is helpful in

A) Area Calculation B) Shape calculation
C) Depth calculation D) Shortest distance calculation

45. When was Survey of India established?

A) During Mughal period B) Post Independence
C) During colonial period D) During Ashoka period

46. Torricelli is given credit for inventing

A) Thermometer B) Barometer C) Sphygmomanometer D) Chronometer

47. Hachures on the map depict

A) Relief B) Length C) Height of Buildings D) Absolute height

48. INSAT is used for

A) Television B) Remote sensing C) Navigation D) Photography

49. Which of the following methods show the population distribution on map?

A) Choropleth B) Isopleth C) Dot D) Line

50. The settlements on topographical maps are shown by colour

A) Yellow B) Green C) Brown D) Red

51. Where do prime meridian and equator intersect on the world map?

A) Atlantic Ocean B) Indian Ocean
C) Pacific Ocean D) Arctic Ocean

52. Bhabar belt is found in the

A) Chota Nagpur Plateau B) Western Ghats
C) Himalayan Piedmont Zone D) Coastal Andhra Pradesh

53. The old name of Burkina Fasso is

A) Gold Coast B) Ivory Coast C) Nyasaland D) Upper Volta

54. The height of places on the earth is measured with reference to

A) Sea level B) Mean sea level
C) High tides D) Centre of the earth

55. India Meteorological Department is under the Ministry of

A) Science and Technology B) Weather Forecasting
C) Earth Sciences D) Atomic Energy

56. The longest day in northern hemisphere takes place on

A) March 21 B) June 21 C) Dec 22 D) June 5

57. Canary island is located in

A) Indian B) Atlantic C) Pacific D) Arctic

58. A biome is the broadest justifiable subdivision of

A) Plant world B) Animal world
C) Water world D) Both plant and animal world

59. Which among the following is the northernmost place in India?

A) Bhopal B) Delhi C) Chamba D) Shimla

60. Port Blair is in

A) Arabian Sea B) Bay of Bengal C) West Bengal D) Tamil Nadu

61. Which of the following states does not have coast?

A) Tamil Nadu B) Odisha C) Karnataka D) Telangana

62. Xerophytes are vegetation of

A) Humid climate B) Dry climate
C) Wet climate D) Rainy climate

63. Solar eclipse is a condition when

A) Moon comes between earth and sun B) Earth comes between moon and sun
C) Sun comes between moon and earth D) Rahu and Ketu come on earth

64. Which of the following is the nearest planet with respect to Sun?

A) Earth B) Venus C) Mars D) Uranus

65. Fathom is a unit to measure

A) Depth in ocean B) Weight C) Volume D) Wave length

66. Which planet rotates on its axis from east to west?

A) Earth B) Venus C) Jupiter D) Mercury

67. The most earthquake prone zone is

A) V B) IV C) III D) II

68. Light year is a unit to measure

A) Light B) Depth C) Geological Time D) Astronomical distances

69. Survey of India topographical sheet having No 53 A/ 16 will have map scale of

A) 1: 1Million B) 1: 250000 C) 1:50000 D) 1:25000

70. Contours on topographical maps are marked in ------colour.

A) Red B) Black C) Brown D) Blue

71. Isoneph is associated with

A) Rocks B) Minerals C) Water D) Clouds

72. Sriharikota is most popular for

A) Tourist spot B) Satellite Launching station

C) Atomic power station D) Thermal Power station

73. Which of following projections will show half of hemisphere?

A) Conial B) Gnomonic C) Stereographic D) Polar

74. *Penda , podu, jhuming* are local names used in different parts of India to denote which kind of cultivation?

A) Intensive B) Shifting C) Commercial D) Extensive

75. Which of the following is not a *kharif* crop

A) Mustard B) Paddy C) Sugarcane D) Cotton

x-x-x

M.Com.(Business Economics)

1. Which account is prepared to know cash purchase or cash sales?
A) Trading Account B) Debtor's Account
C) Creditor's Account D) Cash A/c

2. Net Assets minus Capital Reserve is _____
A) Goodwill B) Total assets
C) Purchase consideration D) None of these

3. All direct & indirect expenses related to business are charged under_____
A) Profit and loss account
B) Trading account
C) Trading account Profit and Loss account
D) Directly to Balance sheet

4. Generally, depreciation on fixed assets is calculated on which balance?
A) Opening B) Closing
C) Only on additional D) Amount realized on asset sold

5. Bad debts written off always affected the_____
A) Debtors A/c B) Creditor A/c C) Cash A/c D) None of these

6. Which of the following accounting equation is correct?
A) Capital + Liabilities= Assets B) Capital = Assets + Liabilities
C) Capital-Liabilities = Assets D) Capital + Assets = Liabilities

7. All capital expenditures and receipts are taken to
A) Trading and Profit and Loss Account B) Balance sheet
C) Trial balance D) None of the above

8. Which of the following cost is also known as overhead cost or on cost?
A) Cost of direct labour B) Cost of indirect labour
C) Direct expenses D) Indirect expenses

9. Minimum number of members in case of public company is_____
A) 4 B) 5 C) 6 D) 7

10. If company A purchases the majority shares of company B, what combination would this be referred to?
A) Amalgamation B) Takeover C) Absorption D) None of these

11. Merger of two or more companies or business undertaking to form new company means_____
A) Reconstruction B) Amalgamation
C) Absorption D) Commandment of Company

12. Which of following is not method of winding up of a company?
A) Compulsory winding up
B) Voluntary winding up
C) Winding up under the supervision of the court
D) Knowingly winding up

13. Shares received from the new company are recorded at_____
A) Face value B) Average price
C) Market value D) None of the above

14. A Joint Stock Company is managed by the Board of Directors elected by _____
A) Top management B) Shareholders
C) Employees of company D) None of the above

15. Joint Venture is a _____
A) Personal A/c B) Nominal A/c C) Real A/c D) Memorandum A/c

16. By which act government checks restrictive trade?
A) Industrial Policy Act 1991 B) MRTP Act
C) FEMA act D) None of these

17. Relaxing the restrictions and controls imposed on business and industry means_____
A) Liberalization B) Privatization C) Globalization D) None of the above

18. Privatization of ownership through sale of equity share is called_____
A) Denationalization B) Disinvestment
C) Contracting D) None of these

19. Globalization is the term used to describe process of removal of restriction on_____
A) Foreign Trade B) Investment C) Both (A) and (B) D) None of the above

20. Laissez faire policy is adopted in_____
A) Socialist Economic System B) Capitalist Economic system
C) Mixed Economic System D) Socialist Economic System

21. Which of the following is not the objective of Competition Act 2002?
A) Prohibition of abuse of dominant position
B) Prohibition of restrictive trade practices
C) Prohibition of anti-competitive agreement
D) Regulation of combinations

22. FEMA stands for_____
A) Free Export management act B) Foreign Exchange management act
C) Foreign Exchange monitoring act D) Free Export marketing act

23. The concept of small scale industries (SSIs) was brought by the_____

A) Industrial Policy Resolution 1948 B) Industrial Policy Resolution 1956
C) Industrial Policy Statement 1977 D) None of the above

24. What is full form of SWOT?
A) Strengths, Weaknesses, Opportunities and Threats
B) Software Warehousing of Threats
C) Single optimism technique
D) None of these

25. The essential commodities act was passed in the year _____
A) 1952 B) 1945 C) 1959 D) 1955

26. What is IRDA?
A) Industrial Regulation & Development Authority
B) Insurance Regulatory & Development Authority
C) Indian Regulation Development Authority
D) None of these

27. The heavy industry strategy of the Mahalanobis model was initiated in___
A) First plan B) Second plan C) Third plan D) Fourth plan

28. Phillips curve describes the relationship between_____
A) Saving and investment
B) Demand for money and inflation
C) Rate of unemployment and rate of inflation
D) Marginal Tax rate and rate of inflation

29. Which one of the following is called as the Gossen's first law?
A) Law of indifference B) Law of diminishing utility
C) Law of returns to scale D) Law of variable proportions

30. The terms TRIPS and TRIMS are related to:
A) NAFTA B) SAFTA C) EFTA D) GATT

31. IMF is the result of_____
A) Hawana conference B) Rome conference
C) Bretton woods conference D) Geneva conference

32. When a firm's average revenue is equal to its average cost, it gets _____.
A) Super profit B) Normal profit C) Sub normal profit D) None of these

33. Under perfect competition, price is determined by the interaction of total demand and_____
A) Total supply B) Total cost C) Total utility D) Total production

34. The kinked demand curve explains_____

A) Demand flexibility B) Demand rigidity
C) Price flexibility D) Price rigidity

35. With the introduction of GST, imports will be_____
A) More expensive B) More cheaper
C) Neutral with no change D) None of the above

36. The rate of GST as applicable on goods and services are___
A) 0% 5% 12% 16% 28% B) 0% 5% 12% 18% 28%
C) 0% 6% 12% 18% 28% D) 0% 5% 12% 18% 26%

37. GST would not be applicable to_____
A) Alcohol for human consumption B) Petrol
C) Natural gas D) All of these

38. What is cut off turnover limit for compulsory registration under GST?
A) 9 lacs B) 50 lacs
C) Exceeds 20 lacs D) No limit for registration

39. Cost of conversion is equal to___
A) Prime cost plus factory overheads
B) Prime cost plus administrative overheads
C) Direct material plus selling and distribution overheads
D) Direct labour plus factory overheads

40. While preparing the financial statements of an enterprise, the bad debt recovered has to be shown on the_____
A) Debit side of the profit and loss account
B) Credit side of the profit and loss account
C) Debit side of the trading account
D) Assets side of the balance sheet

41. The excess of minimum rent over actual royalties is called _____
A) Short workings B) Interest C) Discount D) Commission

42. Which strategy provides a means for achieving a company's annual objectives?
A) Functional strategy B) Business strategy
C) Operating strategy D) Strategic choice

43. Which of the following helps a manager identify the opportunities and threats in the competitive industrial environment?
A) Analyzing the competitive forces B) Market research
C) Market analysis D) Sales analysis

44. Which factor indicates the nature and direction of the economy in which a firm operates?
A) Economic environment B) Gross national product

C) Competitive position D) Operating environment

45. A _____ is primarily financed by borrowing of all the stock or assets by a small group of investors.
A) Merger B) Takeover C) Leveraged buyout D) Consolidation

46. Which of the following factors does not influence the pricing strategy of a firm?
A) Cost B) Market C) Competition D) R&D

47. There are two major ways in which a firm can gain cost advantage. The first is controlling cost drivers, and the second is _____.
A) Shortening the value chain
B) Technological innovation
C) Introducing cost consciousness in all activities
D) Reconfiguring the value chain

48. MNCs are usually _____ in nature
A) Oligopolistic B) Perfectly competitive
C) Monopolistic D) Monopoly

49. Law of diminishing marginal rate of substitution is associated with____
A) Hicks B) Keynes C) Slutsky D) Marshall

50. What kind of tax is Goods and Service Tax?
A) Direct Tax
B) Indirect Tax
C) Depends on the type of goods and services
D) None of the above

51. What is the target (in terms of GDP) of Fiscal Deficit for FY 2019-20?
A) 3.1% B) 3.5% C) 3.4% D) 4.4%

52. Which of the following does not comes under the developmental expenditure of India?
A) Expenditure on administrative services
B) Defense expenditure
C) Grants to states
D) Expenditure on social welfare schemes

53. Devaluation of a currency means_____
A) Reduction in the internal value of the domestic currency
B) Reduction in the external value of the domestic currency
C) Increment in the internal value of the domestic currency
D) Reduction in the printing of new currency by the RBI

54. Who is the father of green revolution in India?
A) Norman Borlaug B) M.S. Swaminathan

C) Salim Ali D) Sam Pitroda

55. The pure monopolist obtains equilibrium level of output when____

A) Marginal revenue = marginal cost B) Price = marginal cost
C) Price is the lowest D) Price is the highest

56. Hedging refers to____

A) The acceptance of a foreign exchange risk
B) The covering of a foreign exchange risk
C) Foreign exchange speculation
D) Foreign exchange arbitrage

57. For substitutes, cross elasticity of demand is_____

A) Positive B) Negative C) Zero D) Always less than one

58. The characteristics of monopolistic competition are_____

a) Product differentiation
b) Non-price competition
c) Large number of firms and freedom to entry and exit
d) Firms are interdependence

Codes:

A) -a & c are correct
B) -a, b and d are correct
C) -a, b and c are correct
D) -a, c and d are correct

59. Which of the following is true?

a) Indifference curves slope downward from left to right.
b) Indifference curves slope downward from right to left.
c) Indifference curves are convex to the point of origin of the two axes.
d) Indifference curves never intersect each other

Codes:

A) -a, b and c are true.
B) -b, c and d are true.
C) -a, c and d are true.
D) -a and d are true.

60. A demand curve, which is parallel to the horizontal axis, showing quantity, has the price elasticity equal to____

A) Zero B) Infinity C) Less than one D) One

61. An exceptional demand curve is one that moves_____

A) Upward to the right B) Downward to the right
C) Horizontally D) Upward to the left

62. Chi-square test is used to____

A) To test goodness of fit
B) To test the differences in the means of two samples
C) To test the independence of attributes
D) Both A and C

63. Partial correlation is a type of _____
A) Simple correlation B) Multiple correlation
C) Both (A) & (B) D) None of the above

64. Regression analysis is a measure of
A) Degree and direction of relationship B) Degree of association
C) Cause and effect relationship D) None of the above

65. In probability theories, events which can never occur together are classified as_____
A) Collectively exclusive events B) Mutually exhaustive events
C) Mutually exclusive events D) Collectively exhaustive events

66. Probability of rejecting the null hypothesis when it is true is called___
A) Type-II error B) Type-I error C) Standard error D) None of these

67. Chi-squire test is a ___
A) Parametric Test B) Non- Parametric test
C) Small –sample test D) Large –sample test

68. Who is the 'lender of the last resort' in the banking structure of India?
A) State Bank of India B) Reserve Bank of India
C) EXIM Bank of India D) Union Bank of India

69. When was the first five-year plan of India started?
A) 1949 B) 1940 C) 1952 D) 1951

70. In India monetary policy is implemented by___
A) RBI B) The ministry of finance
C) Planning commission D) The parliament

71. The perfect competition is characterized by _____
A) Seller as a price taker B) Firms selling identical products
C) Presence of many firms D) All of these

72. Which market structure indicates the existence of 'few sellers'?
A) Oligopoly B) Monopoly
C) Monopolistic competition D) Perfect competition

73. Opportunity cost means _____
A) Cost of a homogenous products B) Cost of the last unit
C) Cost of next best alternative D) Cost of all units produced

74. What is the base year for calculating Wholesale Price Index?

A) 2004-05 B) 2001-02 C) 2011-12 D)2014-15

75. Which is the correct formula to calculate GDP deflator?

A) Nominal GDP - (minus) Real GDP B) Nominal GDP + Real GDP

C) Nominal GDP/ Real GDP D) Real GDP/ Nominal GDP

x-x-x

1. Who was the head of the British Government in India when the Congress for the first time passed its famous resolution for complete independence at Lahore?
A) Lord Irwin
B) Lord Chelmsford
C) Lord Wellington
D) Lord Harding

2. The city of New York is situated on the banks of the river;
A) Hudson
B) Seine
C) Danube
D) Thames

3. The famous Salarganj Museum is situated in;
A) Allahabad
B) Ahmadabad
C) Jalalabad
D) Hyderabad

4. Who was the President of Indian National Congress whose father also became the President of Indian National Congress?
A) Mahatma Gandhi
B) Subhash Chandra Bose
C) Jawaharlal Nehru
D) Bhagat Singh

5. What is ISLAND UNIVERSE?
A) A spiral nebula regarded as forming a separate stellar system
B) Solar System
C) Milky way
D) Isolation of earth

6. From which date the constitution of India came into force?
A) 26 January 1950
B) 20 January 1950
C) 15 August 1947
D) 26 January 1947

7. The author of "War and Peace" was
A) Leo Tolstoy
B) Aldous Huxley
C) Charles Dickens
D) Adam Smith

8. The headquarter of UNESCO is at
A) Paris
B) Geneva
C) Hague
D) Washington

9. Who invented the wireless telegraph?
A) J.L.Baird
B) Alfred Nobel
C) Marconi
D) Waterman

10. The first president of Indian Republic was
A) C. Rajagopalachari
B) Dr. Rajendra Prasad
C) Dr. Radha Krishnan
D) Fakhruddin Ali Ahmad

11. The capital of Malaysia is
A) Bangkok
B) Jakarta
C) Port Louis
D) Kula Lumpur

12. With which game Davis Cup is associated?
A) Lawn Tennis
B) Table Tennis
C) Badminton
D) Water Polo

13. Vikram Sarabhai Space Centre is situated in
A) Maharashtra
B) Gujarat
C) Kerala
D) Tamilnadu

14. Find the odd man out
A) Opium
B) Barley
C) Cotton
D) Tobacco

15. Gown is to Garment as Bible is to
A) Jesus
B) Christianity
C) Religion
D) Book

16. Beta is to Delta as March is to
A) April
B) February
C) May
D) January

17. A is the father of B but B is not the son of A. What is B to A?
A) Daughter

B) Son
C) Niece
D) Brother

18. X is the brother of Y. Y is the daughter of Z. Z is the brother of W. what is W to X?
A) Son
B) Nephew
C) Father
D) Uncle

Directions - (questions 19-23). In each of the following questions, there is some relationship between the two word to the left of the sign:: and the same relationship exists between the word on its right and one of the four alternatives under it. Find the correct alternative.

19. Food: Stomach:: Fuel
A) Engine
B) Automobile
C) Rail
D) Aeroplane

20. Alphabet: Word :: Word:
A) Sentence
B) Sound
C) Dictionary
D) Music

21. Life: Death:: Hope:
A) Cry
B) Pain
C) Despair
D) Sad

22. Hunter: Gun:: Writer:
A) Book
B) Pen
C) Poem
D) Page

23. Adult: Baby:: Flower:
A) Seed
B) Bud
C) Fruit
D) Butterfly

24. Find the odd man out
A) Chair
B) Cot
C) Table

D) Wood

25. A father tells his son, "I was of your present age when you were born." If the father is 44 now, how old was the son 5 years back?
A) 15
B) 13
C) 17
D) 20

26. Find the odd man out
A) Sun
B) Earth
C) Venus
D) Saturn

27. Madhu went to a movie nine days ago. She goes to movies only on Thursdays. What day of the week is today?
A) Sunday
B) Tuesday
C) Thursday
D) Saturday

28. Find the odd man out
A) Apple
B) Mango
C) Orange
D) Carrot

29. Pointing towards a girl in a photograph, Umesh said, "Her mother's brother who is my father is the only son of her mother's father." How is the girl's mother related to Umesh?
A) Mother
B) Sister
C) Aunt
D) Grandmother

30. Find the odd man out
A) Crow
B) Duck
C) Pigeon
D) Parrot

31. Ajay works more than Ram. Alok works as much as Raju. PankaJ works less than Alok. Ram works more than Alok. Who work the most of all?
A) Ajay
B) Alok
C) Ram
D) Raju

32. How many consonants are the between the second and fourth vowel in the alphabet?
A) 7

B) 8
C) 9
D) 10

33. If you are eleventh in a queue starting from either end, how many are there in the queue?
A) Twenty
B) Twenty two
C) Twenty one
D) Twenty three

Direction for Questions 34-38. Two objects, events or concepts are related to each other in some way, you have to establish the same relationship with the two other objects, event or concepts on the basis of the alternatives given below each alternative.

34. Light: Sun:: Heat : ?
A) Electricity
B) Moon
C) Star
D) Fire

35. Disease: Health:: Freedom: ?
A) Pleasure
B) Beauty
C) Plight
D) Slavery

36. Butter: Milk:: Oil : ?
A) Cow
B) Oil -seeds
C) Curd
D) Grains

37. Parrot: Cage: Man : ?
A) Prison
B) Home
C) Forest
D) Motor Car

38. Obey: Defy:: Work : ?
A) Life
B) Rest
C) Challenge
D) Opportunity

39. Find the odd one out
A) 36
B) 45
C) 72
D) 38

Directions for Question 40-44. Answer the question based on given data.

PROJECTED AND ACTUAL PRODUCTION OF CARS OF 5 DIFFERENT COMPANIES

(Number in '000)

	A		B		C		D		E	
Year	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
2012	22	20	16	12	21	20	22	16	22	20
2013	26	21	21	14	22	18	20	18	18	16
2014	24	15	15	14	26	20	22	20	20	18
2015	29	14	14	10	30	22	29	23	23	19
2016	28	18	18	15	34	28	26	21	21	17
2017	31	22	22	18	36	31	30	28	28	26

40. Which company has the highest actual production of cars over these years?

A) A
B) B
C) C
D) D

41. Which year has the lowest projected production of cars of all the five companies?

A) 2012
B) 2013
C) 2015
D) 2017

42. What is the percentage of actual production of cars compared to the projected production of cars of company D in the years 2013?

A) 85
B) 86
C) 90
D) 92

43. Which company has continuous increase in actual production of cars over these years?

A) A
B) B
C) C
D) None

44. What is the approximate percentage of actual production of cars compared to projected production of cars of company B over the years?

A) 80
B) 78
C) 82
D) 74

Directions for Question 45-49. Answer the question based on given data.

Export in Rs. Crores				
	1961	1962	1963	1964

U.P	261	271	381	360
Bihar	160	165	195	205
M.P	350	270	260	370
AP	141	143	190	144
Punjab	470	490	530	690
Haryana	410	450	560	720
W. Bengal	150	240	290	470

45. Which State has recorded the maximum growth in exports from 1961 to 1964?
A) U.P.
B) Punjab
C) Haryana
D) W.Bengal

46. The total exports of U.P., Bihar and West Bengal in 1964 were;
A) Rs. 1135 crores
B) Rs. 1030 crores
C) Rs. 1035 crores
D) Rs. 1045 crores

47. The ratio between the exports of M.P., and West Bengal in 1961 was;
A) 7:2
B) 7:5
C) 7:6
D) 7:3

48. The percentage growth in the exports of West Bengal from 1961 to 1964 was
A) 213.33
B) 113.33
C) 331.33
D) 31.33

49. Total exports of Punjab from 1961 to 1964 were;
A) Rs. 2130 crores
B) Rs. 2030 crores
C) Rs. 2180 crores
D) Rs. 2040 crores

Directions for Question 50-54. Answer the question based on given data.

	Voting for	Voting against	Indifferent	Total
Men	350	750	250	1350
Women	450	1250	50	1750
Total	800	2000	300	3100

50. Which of the following conclusion drawn is correct?
A) 10% people did not take part in the polling

B) Women are less interested in polling as compared to men
C) Polling has become unpopular in India
D) 64.51% people did not vote in favor of the party

51. Percentage of people voting for was
A) 25.80 B) 25.50 C) 64.1 D) 14.61

52. Percentage of women voting against was
A) 71.23 B) 43.71 C) 64.56 D) 71.43

53. The ratio between the participating men and women is
A) 27:35 B) 35:27 C) 23:35 D) 25:45

54. The ratio between those voting for and against was
A) 2:3 B) 2:5 C) 2:7 D) 2:1

55. Cost of retained earnings is closely related to the cost of:
A) Preference shares
B) Fixed deposits
C) Equity shares
D) Long-term debts

56. If the liquidity of a firm is enhanced beyond genuine needs, it:
A) Decreases the profitability
B) Increases the profitability
C) Does not have any impact on the profitability
D) The impact on profitability cannot be ascertained

57. Following information is available in respect of a material item; minimum limit 500 units, maximum limit 2500 units, daily requirement of material 100units, time required for fresh delivery 10 days. The ordering level will be
A) 1000 units B) 1500 units C) 2000 units D) 2500 units

58. The gross profit margin is unchanged, but the net profit margin declined over the same period. This could have happened if
A) Cost of goods sold increased relative to sales
B) Indirect expenses increased relative to sales
C) The Government increased the tax rate
D) Dividends were decreased

59. A company can improve (lower) its debt-to-total assets ratio by doing which of the following?
A) Borrow more
B) Shift short-term to long-term debt
C) Shift long-term to short-term debt
D) Sell equity share

60. Auditor of a company is appointed for a period of
A) One year
B) Two years
C) Five years

D) From the conclusion of one annual general meeting to the conclusion of next annual general meeting

61. Auditor of a public Company is appointed by
A) Company Secretary
B) Shareholders in general meeting
C) Board of directors
D) Controller of Capital issues

62. Which of the following is correct?
A) Internal control is a part of internal check
B) Internal check & internal audit are the same
C) Internal audit is a part of internal control
D) Internal control is a part of internal audit.

63. Bad loans in banking terminology are generally known as–
A) BPOs B) Prime Asset C) NPAs D) CBS

64. The term divisible profit means;
A) Profit after tax
B) Profit after interest and tax
C) Profit before tax
D) Profit which can be legally distributed to the shareholders of a company as dividend

65. The change in TR resulting from the sale of the one unit more of output means:
A) MR from a given input
B) MR from a given output
C) AR from a given output
D) Additional profit from additional unit sold

66. Monetary and credit policy in India is announced by
A) Finance Ministry
B) Reserve Bank of India
C) Commerce Ministry
D) Prime Minister

67. The BSE SENSEX is based on
A) 100 shares B) 1000 shares C) 30 shares D) 500 shares

68. The central Bank of our country is
A) State Bank of India
B) Reserve Bank of India
C) Bank of India
D) Central Bank of India

69. Ad valorem duty is levied according to
A) Value
B) Quantity
C) Both of the above

D) None of the above

70. 14 major commercial banks were nationalized in India in
A) 1975 B) 1947 C) 1967 D) 1969

71. Which of the following committees dealt with banking sector reforms in India?
A) Wadhawa Committee
B) Khan Committee
C) Narsimham Committee
D) Wangchoo Committee

72. A letter of credit is produced by
A) An exporter
B) An importer
C) The Government
D) Stock Exchange

73. Average Clause in a fire policy
A) Average the claim on the different policies taken by the insured
B) Insures the property at average premium paid for the last three years
C) Insures the property at the average rate of premium received during the last years only
D) Penalizes under- insurance.

74. The importer cannot take delivery of goods unless he produces the
A) Bill of sight
B) Bill of lading
C) Shipping bill
D) Certificate of Origin

75. When three sugar mills combine, it is an example of–
A) Vertical combination
B) Horizontal combination
C) Diagonal combination
D) Rational combination

x-x-x

M.Com.(Honours)

1. RTI Act 2005 came into force on
A) 12 October 2005
B) 15 August 2005
C) 15 June 2005
D) 1 November 2005

2. Which of the following is an example of intellectual property?
A) Patent
B) Trade Marks
C) Copy right
D) All of the above

3. How many schedules are there in IT Act, 2000?
A) 3
B) 4
C) 6
D) 2

4. Which of the following is not a negotiable instrument?
A) Currency Note
B) Promissory Note
C) Bill of Exchange
D) Cheques

5. If PPP holds
A) The nominal exchange rate will not change
B) The real exchange rate will not change
C) Both real and nominal exchange rates will not change
D) Both Real and Nominal exchange rates will move together

6. India is facing continuous deficit in its balance of payments. In the foreign exchange market rupee is expected to
A) Depreciate
B) Appreciate
C) Show no specific tendency
D) Depreciate against currencies of the countries with positive balance of payments and appreciate against countries with negative balance of payment.

7. Hedging transaction is indicated by
A) Transactions in odd amounts
B) Presentation of documentary support
C) Frequency of such transactions
D) None of the above

8. Following the Uruguay Round Agreement, GATT was converted from a provisional agreement into WTO with effect from

A) January 1, 1994
B) April 1, 1994
C) January 1, 1995
D) March 1, 1995

9. Which one is not an international organization?
A) SAARC
B) ASEM
C) ASEAN
D) CBDT

10. A letter of credit means
A) A bank agreeing to accept and pay on due date
B) A letter containing conditions of credit purchase or sale
C) A letter sent by exporter to importer sanctioning credit deal
D) A letter sent by importer to exporter sanctioning credit deal

11. RBI notifies CRR under _____ Act.
A) Section 24 of the Banking Regulation Act
B) Section 42 of the Banking Regulation Act
C) Section 24 of the RBI Act
D) Section 42 of the RBI Act

12. As per RBI's clean note policy writing on a currency note is
A) An Offence
B) A crime
C) A punishable offence
D) The notes becomes non-legal tender

13. Which one among the following has not started commercial banking?
A) SIDBI
B) IDBI
C) ICICI
D) UTI

14. HRM does not include
A) Job Evaluation
B) Performance Appraisal
C) Sale promotion
D) Job enrichment

15. 360 degree method relates to
A) Performance Appraisal
B) Organizational climate
C) Employee Morale
D) Retrenchment

16. If the current ratio is 2:1 and working capital is Rs 60,000. What is the value of the current assets?
A) Rs 60,000
B) Rs 1,00,000
C) Rs. 1,20,000
D) Rs 1,80,000

17. Which is not a form of internet Marketing?
A) On-Line Marketing
B) Internet Advertising
C) E-Marketing
D) Product Mix and Branding

18. Which is the base of Green Marketing?
A) Greenhouse gas reduction market
B) Capital Flow
C) Programme
D) Product

19. According to the principle of 'Span of Control' there is
A) A tendency of overload supervisors with too much work
B) A limit to a number of subordinates a supervisor can effectively supervise
C) No limit to the number of subordinates a supervisor can supervise
D) A limit to delegation of authority to the subordinate.

20. MBO is a technique which requires that the objectives of the enterprise
A) Be Written and defined in broad terms
B) Lay down the time period for achieving the desired results
C) Include a plan of action for achieving the desired result
D) Be defined in terms of measurable results

21. The Managerial Grid was developed by
A) Rensis Likert
B) Stanton
C) Jones
D) Robert Blake and JoneMounton

22. Who coined the term Scientific Management?
A) Elton Mayo
B) Henry Fayol
C) F.W.Taylor
D) Rensis Likert

23. Theory X is the theory of
A) Controlling
B) Financial Planning
C) Motivation

D) Planning

24. In Vroom's Expectancy theory, Valence means
A) Strength of an individual's preference for a particular outcome
B) Salary
C) Supervision
D) Knowledge of Planning

25. To indicate the functions of management the catch work PODSCORB was coined by
A) Luther Gullick
B) Henry Fayol
C) Ernest Dale
D) Peter F Drucker

26. Which one of the following is not a measure of dispersion
A) Quartile
B) Range
C) Mean Deviation
D) Standard Deviation

27. Chunk Sampling is known as
A) Quota Sampling
B) Convenience Sampling
C) Judgement Sampling
D) Cluster Sampling

28. The value of Karl Pearson's coefficient of correlation cannot be
A) +2
B) +1
C) 0
D) 0.5

29. Classification of respondents only on the basis of gender is an application of
A) Ordinal Scale
B) Nominal Scale
C) Interval Scale
D) Ratio Scale

30. We can measure the cause and effect relationship by the help of
A) Time series analysis
B) Cross-Sectional analysis
C) Correlation Analysis
D) Regression Analysis

31. The Law of Diminishing Returns is applied to all the fields of production was stated by
A) A.C Pigou
B) Walras

C) Alfred Marshall
D) David Ricardo

32. An indifference curve is always
A) A vertical Straight line
B) Convex to the origin
C) Concave to the origin
D) A Horizontal Straight Line

33. For maximization of Profit in the short run, the condition is
A) AR=AC
B) MR=MC
C) MR=AR
D) MC=AC

34. Market with one buyer and one seller is called
A) Monopsony
B) Monopoly
C) Bilateral Monopoly
D) Oligopoly

35. The concept of imperfect competition was developed by
A) Marshall
B) Jevons
C) Joan Robinson
D) Mrs. Lillian Gilbreth

36. Cartels under Oligopoly do not survive for long because of
A) Inter firm rivalry
B) Low profit
C) High cost of marketing
D) Heavy Loss

37. 'Kinked' demand curve is related with
A) Monopoly
B) Discriminating monopoly
C) Oligopoly
D) Perfect Competition

38. Income and Expenditure Account is prepared in non-trading concerns in lieu of
A) Manufacturing account
B) Profit and Loss Account
C) Trading Account
D) Cash Book

39. Which of the following is not an example of direct expenses?
A) Dock Charges

B) Customs duty and Excise Duty
C) Royalty
D) Audit Fees

40. Goods withdrawn by the proprietor for his personal use are
A) Shown as a deduction from the purchases
B) Shown as a deduction from sales
C) Treated as sales at cost price
D) Added to the purchases

41. Which of the following accounting equations is not correct?
A) Assets=Liabilities + capital
B) Capital = Assets - Liabilities
C) Liabilities = Assets - capital
D) Liabilities = Assets + capital

42. According to which of the following concepts, revenue is recognized when it is earned rather than when it is collected and recognises when assets or benefits are used rather than they are paid for ?
A) Accrual concepts
B) Realisation concept
C) Cost concept
D) Money measurement concept

43. Which of the following concept is also known as 'Prudence'?
A) Conservatism
B) Consistency
C) Full disclosure
D) Materiality

44. Stock is valued in the books of accounts at
A) Cost price
B) Market price
C) Cost price or market price whichever is less
D) Depends whether LIFO method is used or FIFO method is used

45. The fundamental accounting equation' Assets = Liabilities' is a formal expression of
A) Dual aspect concept
B) Matching concept
C) Going concern concept
D) Money measurement concept

46. Which of the following ways can be used to create 'Secret Reserves'?
A) Writing of excessive depreciation
B) Charging capital expenditure to profit and loss account
C) Showing a contingent liability as an actual liability
D) All of the above

47. A capital reserve is generally created out of profits or gains of a capital nature. Which of the following is not a profit or gain of capital nature?

A) Profit on reissue of forfeited shares
B) Profit on sale of fixed assets
C) Profit prior to incorporation
D) Profit on sale of goods

48. A trader maintains his books of accounts on Single Entry basis. His books of accounts show that his total purchases during the were Rs. 90, 0000 of which he returned goods worth Rs. 10,0000. His credit sales were Rs. 50,0000 and cash sales were Rs. 80,0000. Of the total sales goods returned were Rs. 30,0000. Closing stock is Rs. 1,20,0000. He sells his goods at cost plus 33 1/3%. His opening stock is
A) Rs. 1,20,000
B) Rs. 1,00,000
C) Rs. 80,000
D) Rs. 70,000

49. If the operating expenses exceed gross profit, the excess is referred to as
A) Operating income
B) Operating loss
C) Non-operating expenses
D) Non-operating income

50. Income and Expenditure account starts
A) With a debit balance
B) With a credit balance
C) With no opening balance on either side of the account
D) With debit or credit balance

51. According to the decision in Garner vs. Murray, in the absence of any agreement to the contrary , the deficiency of the insolvent partner must be borne by other solvent partners in
A) Profit-sharing ratio
B) Capital ratio which stood after the dissolution of the firm
C) Capital ratio which stood before the dissolution of the firm
D) Equal proportion

52. Bonus shares can be issue by a company
A) Out of the Reserves created by revaluation of fixed assets
B) Out of share premium not collected in cash
C) Without any provision for it in the Articles of Association of the company
D) Out of free reserves built out of genuine profit

53. Following are the details of a firm:

Opening stock	Rs. 5,000
Purchases	Rs. 20,000
Sales	Rs. 35,000
Closing stock	Rs. 10,000

Expenses Rs. 5,000

The amount of Cash from Operations (CFO) will be

A) Rs. 15,000
B) Rs. 10,000
C) Rs. 5,000
D) Rs. 20,000

54. An obligation of business is

A) Asset
B) Liability
C) Income
D) Expense

55. Credit word has been derived from the Latin word 'credere' which means

A) 'to owe'
B) 'to believe'
C) 'to give
D) 'to take'

56. Depreciation is provided on

A) Fixed assets
B) Current assets
C) Liquid assets
D) Fictitious assets

57. X and Y are partners sharing profits and losses in the ratio 3:2, X's son Z is admitted as a partner. X makes a gift of 1/5 share out of his profits to Z. Goodwill of the firm is valued at Rs. 40,000. Z will pay

A) Rs. 8,000 to X
B) Rs. 4,000 to X and Rs. 4,000 to Y
C) Rs. 8,000 to X and Rs. 8,000 to Y
D) Nothing at all

58. Which of the following methods results in lower valuation of inventory and lower income when prices are rising?

A) FIFO
B) LIFO
C) Simple average method
D) Weighted average method

59. Statutory audit is the audit which is

A) Compulsory under some law in force
B) Nothing but another name of internal audit
C) Conducted on continuous basis
D) Applicable in case of sole proprietary concerns

60. An interim audit is conducted

A) At the end of the financial year

B) As per the direction of the Central Government only
C) In between two annual audits
D) For Government companies only

61. An auditor of a partnership firm is appointed as per
A) Statute
B) Government orders
C) Agreement
D) Convention

62. According to companies act, when the dividend proposal is exceeding 20 per cent of the paid-up capital, the amount to be transferred to reserve shall not be less than
A) 7.5 percent of the current profit
B) 10 per cent of the current profit
C) 12.5 per cent of the current profit
D) 15 percent of the current profit

63. If a company buys back its shares/ securities out of free reserves, it must transfer sum equal to the nominal value of the shares/securities to
A) Capital Redemption Reserve Account
B) General Reserve Account
C) Capital Reserve Account
D) Shares/securities Buy Back Account

64. The liability of a sole trader is
A) Limited to the extent of the capital invested into the business
B) Limited to extent of capital invested in the business plus bank balance if any
C) Unlimited
D) Limited in some cases and unlimited in other

65. Which of the following can become partner?
A) Alien enemy
B) Minor
C) Person of unsound mind
D) Corporation

66. 'Insurer' is a person who has
A) Insured his life or goods
B) Helped a person to get an insurance policy
C) Undertaken to make good the loss of the subject matter of insurance
D) Filed a suit in a court of law to recover an insurance claim

67. Purchase and sale of securities beyond the official working hours is known as
A) Kerb trading
B) Rigging
C) Cornering
D) Hammering

68. Which one of the following is not related to the trait theory of leadership?
A) Physical factors such as height
B) Intelligence and extroversion
C) Self confidence and ambition
D) Training and experience of employees

69. Job specification is
A) The specification required for the job
B) A statement of the skills and abilities needed in the performance of a job
C) A statement of the duties and responsibilities of the job
D) The manner in which the job is to be performed

70. Which one of the following orders indicates the correct logical order of managerial functions ?
A) Organising, planning, directing, staffing, coordination and control
B) Planning, organising, staffing, directing, control and coordination
C) Planning, directing, organising, staffing, control and coordination
D) Organising, planning, staffing, directing, control and coordination

71. If the span of control is narrow, a number of managers would be required in each unit of the organisation and there would be many managerial levels or layers. Such an organisational structure is referred to as
A) Flat structure
B) Tall structure
C) Matrix structure
D) Project structure

72. Theory Y states that
A) Workers prefer to directed
B) Workers exercise self-control and self-direction
C) Workers have inherent liking for work
D) None of the above

73. *Esprit de corps* principle of management states that
A) There is need for team work
B) Labour turnover should be minimised
C) Discipline should be maintained
D) There should be only one superior for each subordinate

74. In Taylor's functional organisation, *gang boss*
A) Inspects the quality of work done
B) Issues instructions to workers
C) Sets up tools and machines for work
D) Compiles cost of production

75. Which theory of motivation assumes that average human being dislikes work?
A) McGregor's Theory X

B) Theory Y
C) Maslow's theory
D) Equity theory

76. The Articles of Association establishes relationship between
A) Company and its member
B) Company and outsider
C) Company and its members *inter se*
D) Company and banker

77. The doctrine of Indoor Management means
A) So far as the internal proceedings of the company are concerned, strangers dealing with the company are entitled to assume that everything is done regularly
B) Regularity of internal proceedings must be inquired into before dealing with the company
C) Both A) and B)
D) None of the above

78. Quorum for general meeting for private and public companies is
A) 2 and 5
B) 3 and 6
C) 5 and 7
D) None of the above

79. When a person transacts with a company on a matter which is beyond the power of the company, the person will be governed by the doctrine of
A) Indoor management
B) Self assessment
C) Constructive notice
D) Management by exception

80. A company can invest money in another company only if it is so authorised by its
A) Memorandum of association
B) Articles of association
C) Auditors
D) Company secretary

81. A and B were only two members of a private limited company. Both of them have been killed in a bomb blast. The consequences will be
A) The company will cease to exist
B) The company does not cease to exist
C) The company may o may not exist depending on the terms of Memorandum of association
D) Depends on the conditions contained in the certificate of Incorporation granted by the registrar of Companies

82. A registered company is the company which is incorporated

A) Under the Companies Act, 1956
B) By a special notification of the Central government
C) Under the Indian registration act
D) By a special act of parliament or state

83. Window dressing is prohibited due to
A) Convention of conservatism
B) Convention of disclosure
C) Convention of materiality
D) Accrual concept

84. Leased property is generally depreciated by
A) Annuity method
B) Fixed instalment method
C) Reducing balance method
D) Insurance policy method

85. Assets in the balance sheet of a company are arranged in order of
A) Liquidity
B) Permanence
C) Book value
D) Market value

x-x-x

MBACIT

1. Who is the president of Egypt?
- A) Mahmoud El-Sharif
- B) Abdel Fattah el-Sisi
- C) Hassan Rouhani
- D) Mostafa Madbouly

2. Santosh Trophy is related to which sports?
- A) Badminton
- B) Football
- C) Cricket
- D) Chess

3. The Nobel Prizes are not presented for
- A) Physics
- B) Chemistry
- C) Literature
- D) Arts

4. Who was the first Indian to receive a Nobel Prize?
- A) Chandra Shekar Venkata Raman
- B) Mother Teresa
- C) Rabindranath Tagore
- D) Dan Shechtman

5. Which part of the sun is visible during total solar eclipse?
- A) Corona
- B) No part
- C) Photosphere
- D) Chromosphere

6. The type of mirror used in the headlamps of cars is the
- A) Spherical convex mirror
- B) Plane mirror
- C) Parabolic concave mirror
- D) Spherical concave mirror

7. Cell was discovered in 1665 by
- A) Robert Hooke
- B) Claude Bernard
- C) Henneguy
- D) Theodor Schwann and Jacole Schleiden

8. Which one of the following is not mentioned in the Indian constitution?
- A) Election Commission
- B) Planning Commission
- C) Public Service Commission
- D) Finance Commission

9. Who decides the disputes regarding the election of the President?

A) The Speaker
B) The Supreme Court
C) The Election Commission
D) The Parliament

10. The temperature decreases with increasing height, in the layer of
A) Stratosphere
B) Lonosphere
C) Troposhere
D) Exosphere

11. Lightning travels at a speed of
A) 9,656 miles per second
B) 19,656 miles per second
C) 99,560 miles per second
D) 96,560 miles per second

12. Which day is celebrated on January 20 every year?
A) National Integration Day
B) World Religion Day
C) International Day of Families
D) International Anti - Drugs Day

13. Who was the author of Manimekalai?
A) Sattanar
B) Tiruttakkadevar
C) Tolkappiar
D) Tiruvalluvar

14. What is the tagline for "Adobe"?
A) Simplicity at work. Better by adobe.
B) Connecting people.
C) Every Little Helps
D) With you all the way.

15. What is the full form of "BoP"?
A) Business Owner's Policy
B) Balance of Payments
C) Balance Of Power
D) Bill of Process

16. Span of management refers to:
A) Activities performed by a manager
B) Number of subordinates supervised by a manager
C) Number of superiors a manager has to report to
D) A management Technique

17. The concept of Managerial Grid has been propounded by
A) Black and Mouton

B) Likert
C) Fiedler
D) Maslow

18. Which one of the following accounting equations is correct?
A) Assets = Owner's Equity
B) Assets = Liabilities + Owner's Equity
C) Assets = Liabilities-Owner's Equity
D) Assets + Liabilities = Owner's Equity

19. Which one of the following accounting conventions stipulates that contingent assets appear as a footnote in the balance sheet?
A) Materiality
B) Consistency
C) Disclosure
D) Conservatism

20. Which one of the following is correct with respect to going concern convention?
A) The enterprise is not going to terminate its operations in the period ahead
B) The enterprise may go out of business in the next accounting period
C) The enterprise may not divest or diversify its operational spheres
D) The enterprise may not revalue its assets during the current accounting

21. Accounting for Intangible Assets are related to
A) AS - 10
B) AS – 12
C) AS - 24
D) AS – 26

22. Bad loans in banking terminology are generally known as–
A) BPOs
B) Prime Asset
C) NPAs
D) CBS

23. A large amount spent on special advertisement is–
A) Capital Expenditure
B) Revenue Expenditure
C) Revenue Loss
D) Deferred Revenue Expenditure

24. Setting the mission which encompasses objectives, policies and goals is known as:]
A) Operational planning
B) Strategic planning
C) Tactical planning
D) Contingency planning

25. Motivational process and not the motivators as such is associated with:
A) Need of Hierarchy theory
B) Two-factor theory

C) ERG theory
D) Expectancy theory

26. Brain storming is used by the management for:
A) Work allocation on the shop floor
B) Generating alternative for problem solving
C) The promotion of research and development
D) Training employees

27. A Balance Sheet shows only
A) Personal Accounts and Nominal Accounts
B) Accounts and Nominal Accounts
C) Personal Accounts and Real Accounts
D) Personal, Real and Nominal Accounts

28. If actual average profit is Rs. 30,000 and normal rate of return is 12%, then capitalization value of the profits will be
A) Rs. 3,60,000
B) Rs. 2,50,000
C) Rs. 3,05,000
D) Rs.4,50,000

29. Liability of a Company Secretary is
A) Contractual only
B) Statutory only
C) Civil only
D) Both contractual and statutory

30. Garner Vs. Murray rule applies in case of
A) Admission of a partner
B) Dissolution of a firm
C) Retirement of a partner
D) Death of a partner

31. Which of the following is not a cost of unemployment?
A) Loss of output within the economy
B) Loss of tax revenue
C) Loss of import flows
D) Loss of profits

32. Under Inductive method, the logic proceeds from :
A) General to particulars
B) Particular to general
C) Both (A) and (B)
D) General to anything

33. Which of the following falls under micro economics?
A) National income
B) General price level
C) Factor pricing

D) National saving and investment

34. Law of Demand states that

A) With the increase in price Quantity increases
B) With the increase in price quantity decreases other things remaining the same
C) Quantity does not change with any increase in price
D) All of the above

35. The Slope of the Indifference Curve indicates

A) Marginal Rate of Substitution of x for y
B) Prices of x and y
C) Slope of the budget line
D) Change in prices

36. If the demand for a good is inelastic, an increase in its price will cause the total expenditure of the consumers of the good to

A) Increase
B) Decrease
C) Remain the same
D) Become zero

37. In the short run, when the output of a firm increases, its average fixed cost:

A) Remains constant
B) Decreases
C) Increases
D) First decreases and then rises

38. Fiscal Policy means:

A) Policy relating to money and banking in a country
B) Policy relating to non-banking financial institutions
C) Policy relating to government spending' taxation and borrowing
D) Policy relating to financial matters of international trade

39. Monetary policy is implemented by in India.

A) The Ministry of Finance
B) Planning Commission
C) The Parliament
D) Reserve Bank of India

40. Which country was the first to adopt a gold standard in the modern sense?

A) Italy
B) France
C) Great Britain
D) Portugal

41. "Underdeveloped countries are the slums of the world Economy." This statement is by

A) Ragnar Nurkse
B) A.N. Caimcross
C) Colin Clark
D) Jagdish Bhagwat

42. Whose name is associated with the "Uncertainty-bearing theory of profit"?

A) J. Schumpeter
B) F.H. Knight
C) J.B. Clark
D) F.W. Watker

43. Under free exchange markets the rate of foreign exchange is determined by

A) Balance of Payments theory
B) Mint par theory
C) Purchasing power parity theory
D) WTO

44. Isoguants are right angled only when

A) Factors are perfect substitutes
B) Factors are neutral
C) Factors are perfect complements
D) Factors are scarce

45. In a perfectly competitive market a firm in the long run will be in equilibrium when

A) AC =MC
B) AR = MR
C) MR = MC
D) P=AR=MR=AC=MC

46. Which one is the first search engine in internet

A) Google
B) Archie
C) Altavista
D) WAIS

47. 1024 bit is equal to how many byte

A) 1 Byte
B) 128 Byte
C) 32 Byte
D) 64 Byte

48. Mac Operating System is developed by which company

A) IBM
B) Apple
C) Microsoft
D) Samsung

49. Ctrl, Shift and Alt are called ..... keys

A) Modifier
B) Function
C) Alphanumeric
D) Adjustment

50. MS-Word is an example of _____

A) An operating system

B) A processing device
C) Application software
D) An input device

51. Microsoft Office is an example of
A) Closed source software
B) Open source software
C) Horizontal market software
D) Vertical market software

52. Computer Moniter is also known as
A) DVU
B) UVD
C) VDU
D) CCTV

53. Which one of these stores more data than a DVD ?
A) CD Rom
B) Floppy
C) Blue Ray Disk
D) Red Ray Disk

54. In what year was the @ chosen for its use in email address ?
A) 1972
B) 1976
C) 1980
D) 1984

55. What does SSL stands for ?
A) System socket layer
B) Secure system login
C) Secure socket layer
D) Secure system login

56. Android is developed by
A) Apple
B) Microsoft
C) Google
D) Android Inc

57. Which of the following is latets version of Android
A) Pie
B) Oreo
C) Nougat
D) Marshmallow

58. Who is the father of Internet ?
A) Chares Babbage
B) **Vint Cerf**
C) Denis Riche

D) Martin Cooper

59. WWW stands for_____?

A) World Whole Web
B) Wide World Web
C) Web World Wide
D) **World Wide Web**

60. In MS Word Ctrl+Shift+C is shortkey of:_____?

A) Copy
B) Indent Left
C) Paste
D) **Copy Format Painter**

61. 3, 10, 101, ?

A) 10101
B) 10201
C) 10202
D) 11012

62. 125, 80, 45, 20,?

A) 5
B) 8
C) 10
D) 12

63. 3, 15, ?, 63, 99, 143

A) 27
B) 35
C) 45
D) 56

64. Pointing at a photo, Harnam said, "His father is only son of my mother." The photo belongs to

A) Harnam
B) Harnam 's brother
C) Harnam 's father
D) Harnam 's son

65. A man faces towards north. Turning to his right, he walks 25 metes. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he from his starting point ?

A) South-West
B) South
C) North-west
D) South-East

66. If Durgesh moves 20 metres in East direction and then turns to his left and then moves 15 metres and then he turns to his right and moves 25 metres. After this he turns to his right and moves 15 metres. Now, how far is he from starting point ?

A) 40 m
B) 50 m
C) 25 m
D) 45 m

67. If TOUR is written in a certain code as 1234, CLEAR as 56784 and SPARE as 90847, what will be the 5 digit for SCULPTURE in the same code

A) 3
B) 4
C) 6
D) 0

68. Choose the word which is different from the rest

A) Cap
B) Turban
C) Helmet
D) Veil

69. FAG, GAF, HAI, IAH, ____

A) JAK
B) HAL
C) HAK
D) JAI

70. CMM, EOO, GQQ, _____, KUU

A) GRR
B) GSS
C) ISS
D) ITT

71. Arrange the words given below in a meaningful sequence. 1. Word 2. Paragraph 3. Sentence 4. Letters 5. Phrase

A) 4, 1, 5, 2, 3
B) 4, 1, 3, 5, 2
C) 4, 2, 5, 1, 3
D) 4, 1, 5, 3, 2

72. In a certain language, WEAK is coded as 9%@$ and SKIT is coded as #$7@, then how will WAIT be coded in the same language?

A) 9267
B) 927@
C) 92@6
D) 9@67

73. If "*" is called "+", "/" is called "*", "-" is called "/", "+" is called "-". 40/20 – 5 * 10 + 5 = ?

A) 170
B) 160
C) 150
D) 165

74. How many 8's are present in the following sequence of numbers which are exactly divisible by both its preceding and following numbers?

3 8 6 8 8 7 6 8 3 4 8 2 5 6 2 8 2 4 8 6 3 7 4 8 4 5 8

A) 5
B) 6
C) 3
D) 2

75. If 84 x 13 = 8, 37 x 13 = 6, 26 x 11 = 6 , then 56 x 22 = ?

A) 36
B) 39
C) 7
D) 11

x-x-x

B.P.Ed.

1. Group play is a royal road to
A) Socialization B) Civilization C) Globalization D) Urbanization

2. Platelets scientifically are known as
A) Thrombocytes B) Lymhocytes C) Monocytes D) Lymphomatics

3. Which of the following is the best source for omega-3 fatty acids?
A) Corn oil B) Wheat products C) Pork D) Sardines

4. Which among the following is played on a synthetic hard court?
A) French Open B) Wimbledon C) US Open D) Australia Open

5. How many medals are bagged by India in the Asian Wrestling Championships at Xi'an, China 2019?
A) 18 B) 16 C) 17 D) 15

6. Who won men's singles Australian open 2019?
A) Novak Djokovic B) Rfael Nadal C) Sergi Brugura D) Robert Lindstedt

7. If a student comes late to the school on a daily basis, then it will be appropriate to
A) Throw him out of the class
B) Punish him in the presence of students
C) Complain to the Principal that he is always late
D) Find out the reasons for this behaviour

8. Decreased physical activity is called
A) Hypokinetic B) Kinetic C) Kinematics D) Hyperkinetic

9. Which muscle in the body is called 'Boxer muscle'?
A) Quadriceps B) Hamstrings C) Serratus anterior D) Pectoralis major

10. How many commonwealth nations participated in 2018 Commonwealth Games, officially known as the XXI Commonwealth Games?
A) 72 B) 73 C) 71 D) 70

11. In which year Central Advisory Board of Physical Education and Recreation (CABPER) was set up?
A) 1951 B) 1950 C) 1952 D) 1953

12. Sociology is a body of scientific Knowledge about human
A) Institutions B) Relationships C) Concerns D) Civilizations

13. Women athletes using anabolic steroids to boost muscular performance are specially vulnerable to

A) Reproductive mal- functioning B) Migraines
C) Growth of male characteristics D) Muscle atrophy

14. Name the Indian flag bearer of 2018 commonwealth games during the closing ceremony?
A) P.V Sindhu B) Marry Kom C) Saina Nehwal D) Geeta Phogat

15. The headquarter of WHO is situated at
A) New York B) Geneva C) Paris D) Lausanne

16. The instrument used for estimation of body fat is
A) Flexiometer B) Goniometer C) Skinfold caliper D) Dynamometer

17. Total number of medals won by Indian team at 2018 Asian Games held in Jakarta and Palembang, Indonesia were
A) 68 B) 69 C) 67 D) 66

18. If EDUCATION is written as DECUTAOIN, then COLLEGE will be written as:
A) OCLLGEE B) OCLGEEL C) COELLEG D) EOLCGLE

19. Complete the series 65 : 30 :: 44 :_ ?
A) 79 B) 16 C) 62 D) 28

20. Which of the following factors is not included in the process of class management?
A) Class formation B) Roll call
C) Play field cleanliness D) Class discipline

21. Pointing to a man, a woman said, "He is the only son of my mother's mother." How is the woman related to the man?
A) Aunt B) Daughter C) Niece D) Sister

22. Stanley Cup associated with
A) Hockey B) Ice hockey C) Roller skating D) Baseball

23. Name the Flag bearer of India during the opening ceremony of 2018 Asian games
A) Neeraj Chopra B) Rani Rampal C) P.V. Sindhu D) Mary kom

24. For strength dominating sports, the diet should be rich in
A) Carbohydrates B) Vitamins C) Minerals D) Proteins

25. Who won the 2017 FIFA U-17 World Cup which was hosted by India?
A) England B) Brazil C) Spain D) Mali

26. Total number of medals won by Indian team at 2019 Asian athletic championship held at Doha, Qatar
A) 16 B) 17 C) 18 D) 19

27. In anatomical language, the calf muscle is known as
A) Gastrocnemius B) Glutius maximus C) Trepizius D) Triceps

28. The term 'bully' is associated with which sports:
A) Cricket B) Hockey C) Baseball D) Billiards

29. Which two of the following Olympiads were not celebrated due to the world war-II?
A) X^{th} and XI^{th} B) XII^{th} and $XIII^{th}$ C) $XIII^{th}$ and XIV^{th} D) XV^{th} and XVI^{th}

30. The official languages of the International Olympic Committee are
A) French and English B) English and German
C) Russian and English D) English and Greek

31. When did the International Olympic Committee was formed
A) 21 June 1984 B) 22 June 1894 C) 23 June 1894 D) 24 June 1984

32. The Olympic motto-Citius, Altius, Fortius- in sequence means
A) Higher, stronger, faster B) Faster, stronger, higher
C) Faster, higher, stronger D) Stronger, higher, faster

33. The red blood cells are produced in the
A) Heart B) Bone marrow C) Spinal column D) Cerebrum

34. The Grapplers are
A) Boxers B) Rock Climbers C) Wrestlers D) Judokas

35. Which edition of 2019 Asian Athletics Championship held at the Khalifa International Stadium in Doha, Qatar?
A) 20^{th} B) 21^{st} C) 22^{nd} D) 23^{rd}

36. 2022 Winter Olympics, officially known as the XXIV Olympic Winter Games going to be held at
A) Beijing, China B) Tokyo, Japan C) Moscow, Russia D) Seoul, Korea

37. Who among the following is known as Payyoli Express?
A) Anju Bobby George B) P.T. Usha
C) Kanwaljit Sandhu D) Sania Mirza

38. Who was the first Indian in independent India to have won a medal in an individual Olympic event?
A) K D Jadhav B) Prithipal Singh C) B D Jadhav D) Prithvipal singh

39. Which of the following is considered as the mother of all sports?
A) Wrestling B) Judo C) Gymnastics D) Boxing

40. The ancient Olympic games were held in the honour of God

A) Apollo B) Zeus C) Mars D) Poseidon

41. The term 'Bogey' is associated with which sports:
A) Golf B) Baseball C) Cricket D) Horse race

42. Meta –carpal bones are found in the
A) Knee B) Palm C) Elbow D) Shoulder

43. Which of the following known as glenohumeral joint?
A) Hinge joint B) Elbow joint C) Shoulder joint D) Knee joint

44. Through which of the following does the most of the heat loss occur
A) Skin B) Expired air C) Urine D) Faeces

45. An amphiarthrosis is a
A) Immovable joint B) Freely moveable joint
C) Slightly moveable joint D) Non- moveable joint

46. The human heart- the finest pump ever known- is about the size of a
A) Closed fist B) Big toe C) Human ear D) Open hand

47. Citrus fruits are an excellent source of-
A) Vitamin C B) Protein C) Vitamin A D) Vitamin D

48. As a teacher, what would you do to inculcate the feeling of cooperation in students?
A) Organize a class on cooperation
B) Show movies on cooperation
C) Put them to group work
D) Give them good reading material on cooperation

49. What according to biologists is the seat of life?
A) A cell B) A tissue C) An organ D) A system

50. The motto of the 2018 Asian games was
A) Ever onwards B) Energy of Asia C) Energy of world D) Share the dream

51. Which of the following games was initially called mintonette?
A) Volleyball B) Lawn tennis C) Basketball D) Badminton

52. Characteristically, bones of the face are
A) Long B) Short C) Flat D) Irregular

53. Sociologist consider sport as a
A) Human urge for excellence B) Life commitment
C) Survival Activity D) Socio-cultural phenomena

54. Which one of the followings is a communicable disease?

A) Whooping cough B) Fibromyalgia C) Alzheimer's D) Asthma

55. The teaching of motor skills should be based on the principle of
A) Selectivity B) Flexibility C) Progression D) Complexity

56. The word membrane means
A) An envelope B) A string C) A net D) A mesh

57. The width of all lines in field hockey is
A) 5 cm B) 7 cm C) 7.5 cm D) 5.5 cm

58. The knot used to tie a bandage is known as
A) Reef knot B) Granny knot C) Clove knot D) Half hitch

59. The CPR stands for
A) Cardio-pumping respiration B) Cardio-pulmonary resuscitation
C) Cardiac pain rehabilitation D) Circulatory pain rehabilitation

60. Which of the following officials has no place in volleyball?
A) Timekeeper B) Second umpire C) Scorer D) Linesman

61. The main objective of the intramural programme is
A) Infuse spirit of competition in students
B) Make optimal use of sports facilities and funds
C) Select athletes for extramural
D) Encourage mass participation in physical activities

62. Which of the following game is said to have had its origin during the British period at Pune?
A) Cricket B) Cycle polo C) Badminton D) Judo

63. The running distance between the two opposite wickets is
A) 20 yards B) 22 yards C) 20 meters D) 22 meters

64. Which of the following names does table tennis not bear?
A) Ping pong B) Gossima C) Tick tack D) Whiff- whaff

65. In archery, the distance for Olympic round is
A) 30 m B) 70 m C) 50 m D) 90 m

66. 'Kidambi Srikanth' associated with which sports
A) Badminton B) Baseball C) Billiards D) Basketball

67. There are ….. major types of white blood cells.
A) 4 B) 5 C) 6 D) 7

68. Which of the following is known as the graveyard of RBCs?
A) Spleen B) Liver C) Stomach D) Kidneys

69. Endemic goiter is caused due to the deficiency of
A) Iodine B) Vitamin A C) Iron D) Calcium

70. Hepatitis is an infection of the

A) Liver B) Kidney C) Lungs D) Stomach

71. 'Humpy Koneru' is associated with which sports?

A) Handball B) Chess C) Badminton D) Table tennis

72. Elisa test is used to detect

A) HIV infection B) Blood contamination

C) Tuberculosis D) Malaria parasite

73. In gymnastics, which of the following equipment is used only by women

A) Balancing beam B) Vaulting horse C) Pommel horse D) Horizontal bars

74. A teacher can establish rapport with his students by

A) Impressing them with knowledge and skill

B) Playing the role of a guide with desire to help them

C) Becoming a friend to the students

D) Becoming a figure of authority

75. RBC's also known as

A) Leukocytes B) Erythrocytes C) Thrombocytes D) Lymphocyte

x-x-x

MSc(HS)(Mathematics)

1. If x is real, then the largest interval in which the expression $\left(\frac{1-x+x^2}{1+x+x^2}\right)$ assumes values, is

A) [-1, 1] B) $[\frac{1}{2}, 2]$ C) $[\frac{1}{3}, 3]$ D) $[\frac{1}{4}, 4]$

2. The equation $e^{\sin x} - e^{-\sin x} - 4 = 0$ has

A) No real root B) One real root
C) Two real roots D) Infinitely many roots

3. If $x = 2 + 2^{\frac{2}{3}} + 2^{\frac{1}{3}}$, then the value of $x^3 - 6x^2 + 6x$, is

A) 1 B) 2 C) 3 D) 4

4. The product $2^{\frac{1}{4}}.4^{\frac{1}{8}}.8^{\frac{1}{16}}.16^{\frac{1}{32}}$ ..... is equal to

A) 1 B) 2 C) 3/2 D) 5/2

5. The solution of $\frac{dy}{dx} = e^{-y}\cos x$ with $y(0) = 0$ is

A) $y = \sin x + 1$ B) $e^y = \sin x + 1$ C) $y = e^{\sin x} + 2$ D) $y = \sin x$

6. Bisection method is

A) Always convergent B) Always divergent
C) Not always convergent D) None of these

7. Let $f = \begin{cases} 1\ if\ \ x \text{ is rational} \\ 0\ if\ x \text{ is irrational} \end{cases}$, then

A) f is continuous everywhere on real line
B) f is discontinuous everywhere on real line
C) f is continuous on (0, 1) otherwise discontinuous
D) None of the above

8. Relation between Cartesian and polar spherical coordinates are

A) $x = r\sin\theta\ \cos\phi, y = r\sin\phi\cos\phi, z = r\cos\theta$
B) $x = r\sin\theta\sin\phi, y = r\cos\theta\sin\phi, z = r\cos\theta$
C) $x = r\sin\theta\ \cos\phi, y = r\sin\theta\sin\phi, z = r\cos\phi$
D) $x = r\sin\theta\ \cos\phi, y = r\sin\theta\sin\phi, z = r\cos\theta$

9. Equation of right circular cone in standard form is

A) $x^2 + y^2 + z^2 = \tan^2\alpha$ B) $x^2 + y^2 = z^2\tan\alpha$
C) $x^2 + y^2 = z^2\tan^2\alpha$ D) $x^2 + y^2 - z^2 = \tan^2\alpha$

10. The probability that the 13^{th} day of a randomly chosen month is a second Saturday, is

A) 1/7 B) 1/12 C) 1/84 D) 19/84

11. The limit point of $(a, b)\ a, b \in \mathbb{R}$

A) is a B) is b C) Both a and b D) Every element of [a,b]

12. $\lim_{n\to\infty} \frac{(n!)^{\frac{1}{n}}}{n}$

A) E B) 1/e C) 1 D)e^e

13. If $u = \frac{x^2+y^2}{\sqrt{x+y}}$, then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = K\,u$, where K is

A) 2 B) ½ C) 3/2 D) 2/3

14. The curvature of a circle at any point on it is

A) Constant and equal to radius of the circle
B) Variable
C) Constant and equal to reciprocal of the radius of the circle
D) Proportional to the radius of the circle

15. Weight is a

A) Scalar quantity B) Vector quantity
C) Scalar and vector both D) Mass contained in the body

16. The vectors $\alpha = (a_1, a_2)$ and $\beta = (b_1, b_2)$ in $V_2(F)$ are linearly dependent if

A) $a_1b_1 - a_2b_2 = 0$ B) $a_1b_2 - a_2b_1 = 0$
C) $a_1a_2 - b_1b_2 = 0$ D) None of these

17. The vector space $\{0\}$ is defined to have dimensions

A) Zero B) One C) ∞ D) Not defined

18. A mapping f: □ ⟶ □ which is defined as $f(x) = \sin x\,; x \in$ □ is

A) One-one only B) Onto only
C) One-one onto D) Neither one-one nor onto

19. Let $R = \{x \text{ I } x \in N, x \text{ is multiple of } 3 \text{ and } x \leq 100\}$ and $S = \{x \text{ I } x \in N, x \text{ is multiple of } 5 \text{ and } x \leq 100\}$ What is the number of elements in $(R \times S) \cap (S \times R)$

A) 36 B) 25 C) 49 D) 16

20. Consider the statements

(A) $\lim_{n\to\infty} \frac{(3n)!}{(n!)^3} = 27$

(B) $\lim_{n\to\infty} \frac{n^n}{(n+1)(n+2)\ldots(n+n)} = \frac{e}{4}$

Then

A) (A) is true (B) is false B) (A) is false (B) is true
C) (A) and (B) both are false D) (A) and (B) both are true

21. The value of 'C' of Lagrange's mean value theorem, if $f(x) = x(x-1)(x-2)$; $a = 0, b = \frac{1}{2}$ is

A) 1/4 B) 1/3 C) $\frac{6-\sqrt{(21)}}{6}$ D) $\frac{6+\sqrt{(21)}}{6}$

22. At *t=0*, the function $f(t) = \frac{\sin t}{t}$ has

A) A minimum B) A discontinuity
C) A point of inflection D) A maximum

23. If $f(x,y) = \begin{cases} xy \sin\frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$ then

A) $f_x(0,0) = 1 = f_y(0,0)$ B) $f_x(0,0) = 0 = f_y(0,0)$
C) $f_x(0,0)$ and $f_y(0,0)$ does not exist D) None of these

24. Given the function $f(x,y) = x^2 - 2xy + y^2 + x^3 - y^3 + x^5$, then

A) Has maximum value at origin
B) Has minimum value at origin
C) Has maximum value but no minimum value at origin
D) Has neither maximum nor minimum value at origin

25. If $A = \begin{bmatrix} -5 & -8 & 0 \\ 3 & 5 & 0 \\ 1 & 2 & -1 \end{bmatrix}$, then A^2 is

A) Nilpotent B) Periodic C) Idempotent D) Involutory

26. The square matrix A is defined as $A = \begin{bmatrix} 1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$, the diagonal matrix D of A is

A) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ B) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ D) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -3 \end{bmatrix}$

27. Dim V, where $V = \{a_1, a_2, \ldots a_{100} : a_1 + a_2 = 0, a_3 + a_4 = 0\}$ is

A) 100 B) 102 C) 2 D) 98

28. If C is a non-singular matrix and $B = C \begin{bmatrix} 0 & x & y \\ 0 & 0 & z \\ 0 & 0 & 0 \end{bmatrix} C^{-1}$, then

A) $B^2 = 1$ B) $B^3 = 1$ C) $B^3 = 0$ D) $B^2 = 0$

29. The dimension of the subspace of $\square^3$ spanned by $(-3,0,1), (1,2,1) and\ (3,0,-1)$ is

A) 0 B) 1 C) 2 D) 3

30. The system of equations

$4x_1 + x_2 - 3x_3 - x_4 = 0$
$2x_1 + 3x_2 + x_3 - 5x_4 = 0$ has
$x_1 - 2x_2 - 2x_3 + 3x_4 = 0$

A) No solution

B) Only one solution (0,0,0,0)
C) Infinite no of solutions
D) Only two solutions (0,0,0,0) and (3/5,1,4/5,1)

31. Let A be $n \times n$ matrix which is both Hermitian and unitary. Then
A) $A^2 = I$
B) A is real
C) Eigen values of A are 0,1,-1
D) Characteristics and minimal polynomials are the same

32. Which of the following is correct?
A) R is a vector space over N
B) R is vector space over Z
C) R is vector space over Q
D) R is vector space over C

33. A homogeneous system of 5 linear equations in 6-variables admits
A) No solution in $\square^6$
B) A unique solution in $\square^6$
C) Infinite no of solutions in $\mathbb{R}^6$
D) Finite, but more than two solutions in $\mathbb{R}^6$

34. Minimal polynomial $m(x)$ of $A_{n\times n}$, each of whose element is 1, is
A) $x - 1$
B) $x^2 + x$
C) $x^2 + nx$
D) $x^2 - nx$

35. Let $\begin{bmatrix} 2 & 3 & 4 \\ 0 & 5 & 6 \\ 0 & 0 & 7 \end{bmatrix}$, then
A) A is diagonalizable but not A^2
B) A^2 is diagonalizable but not A
C) Both A and A^2 are diagonalizable
D) Neither A nor A^2 is diagonalizable

36. Let T: $\square^2 \longrightarrow R^3$be a linear transformation given by $T(x_1, x_2) = (x_1 + x_2, x_1 - x_2, x_2)$ then Rank T is
A) 0
B) 1
C) 2
D) 3

37. Let $M = \begin{bmatrix} 1 & a & c \\ 0 & 2 & b \\ 0 & 0 & 1 \end{bmatrix}, a, b, c \in \square$, then M is diagonalizable, if and only if
A) $a = bc$
B) $b = ac$
C) $c = ab$
D) $a = b = c$

38. The $\lim_{z\to 0} \frac{\bar{z}}{z}$ is
A) 0
B) 1
C) ½
D) Does not exists

39. The real part of the complex number $(1 + i)^n$ is
A) $2^{\frac{n}{2}} \cos\frac{n\pi}{4}$
B) $2^n \cos\frac{n\pi}{2}$
C) $2^{-\frac{n}{2}} \cos n\pi$
D) $2^{-n} \cos\frac{n\pi}{2}$

40. The value of m so that $2x - x^2 + my^2$ may be harmonic is
A) 0
B) 1
C) 2
D) 3

41. Let G be a group of order 77. Then, the centre of G is isomorphic to

A) $\mathbb{Z}_1$ B) $\mathbb{Z}_7$ C) $\mathbb{Z}_{77}$ D) $\mathbb{Z}_{11}$

42. The number of zeros at the end of 100! is
A) 22 B) 24 C) 26 D) 20

43. The unit digit of 2^{100} is
A) 2 B) 4 C) 6 D)8

44. The largest integer n such that 33! is divisible by 2^n is
A) 29 B) 28 C) 33 D) 31

45. The number of generators in cyclic group of order 10 are
A) 1 B) 2 C) 3 D) 4

46. For the differential equation $xy' - y = 0$, which of the following is not an integrating factor
A) $\frac{1}{x^2}$ B) $\frac{1}{y^2}$ C) $\frac{1}{xy}$ D) $\frac{1}{x+y}$

47. The solution of $xp + yq = z$ is
A) $f(x^2, y^2) = 0$ B) $f(xy, yz) = 0$ C) $f(x, y) = 0$ D) $f\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

48. The equation $u_t = c^2 u_{xx}$ is classified as
A) Elliptic B) Hyperbolic C) Parabolic D) None of these

49. Simpson's rule for integration gives exact result, when f(x) is a polynomial of degree
A) 1 B) 2 C) 3 D) All of these

50. The Newton-Raphson method converges fast, if $f'(\alpha)$ is (α is the exact value of the root)
A) Small B) Large C) Zero D) None of these

51. If 3 is taken as an approximate root of the equation $x^3 - 30 = 0$, then a better approximation by Newton-Raphson method is
A) 10/3 B) 28/9 C) 8/3 D) 26/9

52. If h is the interval of differencing, then $(\Delta - \nabla)x^2$ equals to
A) $2h$ B) $2h^2$ C) $2h^3$ D) $4h^3$

53. The first term of the series whose second and subsequent terms are $8, 3, 0, -1, 0$ is
A) 5 B) 10 C) 15 D) 20

54. In Simpson's one-third rule the curve $y = f(x)$ is assumed to be a
A) Ellipse B) Hyperbola C) Circle D) Parabola

55. The solution of the equation $\phi(x) = x + \int_0^x (\xi - x)\phi(\xi)d\xi$ is
A) $\sin x$ B) $\cos x$ C) $\tan x$ D) None of the these

56. A perfectly flexible rope of uniform density per unit length is suspended with its end points fixed. It assumes the shape of

A) Cycloid B) Straight line C) Parabola D) Catenary

57. In case of a rigid body, having N particles, the number of degrees of freedom is

A) ∞ B) 3 C) 3N D) N

58. Let X be a random variable whose density function f forms an isosceles triangle above the unit interval $I = [0,1]$ and 0 elsewhere. Then the formula for pdf is

A) $f(x) = \begin{cases} x, \ if\ 0 \le x \le \frac{1}{2} \\ -x + 1, \ if \frac{1}{2} \le x \le 1 \\ 0, elsew\square ere \end{cases}$ B) $f(x) = \begin{cases} 2x, \ if\ 0 \le x \le \frac{1}{2} \\ -2x + 2, \ if \frac{1}{2} \le x \le 1 \\ 0, elsew\square ere \end{cases}$

C) $f(x) = \begin{cases} 3x, \ if\ 0 \le x \le \frac{1}{2} \\ -3x + 3, \ if \frac{1}{2} \le x \le 1 \\ 0, elsewhere \end{cases}$ D) None of these

59. If X is normal with mean 2 and standard deviation 3, then the distribution of $Y = \frac{1}{2}X - 1$ is

A) N(0,9/4) B) N(1,9/4) C) N(0,3/4) D) N(1,3/4)

60. If X and Y be two independent random variables, each representing the number of failures preceding the first success in a sequence of Bernoulli trials with p as probability of success in a single trial and q as probality of failure, then $p(X = Y)$ is

A) $\frac{p}{1+q}$ B) $\frac{q}{1+p}$ C) $\frac{p}{1+p}$ D) $\frac{q}{1+q}$

61. Let $X_1, X_2, \ldots X_n$ be n independent and identically distributed random variables each with mean μ and variance σ^2, and let $\overline{X_n}$ be the sample mean, then variance of $\overline{X_n}$ is

A) 0 B) σ C) $n\sigma^2$ D) $\frac{\sigma^2}{n}$

62. The value of mode for the frequency curve $y = \left(\frac{1}{2}\right)\sin x\,, \ 0 \le x \le \pi \ is$

A) π B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{2}$

63. For a given probability distribution $f(x) = \frac{1}{8}\binom{3}{x}$, $x = 0, 1, 2, 3$ for a random variable X, the moment generating function of this is

A) $\frac{1}{8}(1 + e^t)^3$ B) $\frac{1}{4}e^t$ C) $(1 + e^t)^2$ D) e^t

64. A bag X contains 2 white and 3 black balls and another bag Y contains 4 white and 2 black balls. One bag is selected at random and a ball is drawn from it. Then, the probability for the ball chosen be white is to

A) $\frac{2}{15}$ B) $\frac{7}{15}$ C) $\frac{8}{15}$ D) $\frac{14}{15}$

65. Consider the group S_9 of all the permutations on a set with 9 elements. What is the largest order of a permutation in S_9?

A) 20 B) 21 C) 14 D) 30

66. Suppose V is a real vector space of dimension 3. Then the number of pairs of linearly independent vectors in V is

A) ∞ B) 1 C) 2 D) 3

67. Let X be a connected subset of real numbers. If every element of X is irrational, then the cardinality of X is

A) Infinite B) Countably infinite C) 2 D) 1

68. Suppose the matrix $A = \begin{bmatrix} 40 & -29 & -11 \\ -18 & 30 & -12 \\ 26 & 24 & -50 \end{bmatrix}$ has a certain complex number $\lambda \neq 0$ as an eigen value. Which of the following numbers must also be an eigen value of A?

A) $\lambda + 20$ B) $\lambda - 20$ C) $20 - \lambda$ D) $-20 - \lambda$

69. Let A be a 3×3 matrix with real entries such that $det(A) = 6$ and trace of A is 0. If $\det(A + I) = 0$, where I denotes 3×3 identity matrix, then eigen values of A are

A) -1,2,3 B) $-1, -2, 3$ C) $-1, 2, -3$ D) $-1, -2, -3$

70. Let $a_n = sin\frac{\pi}{n}$. For the sequence $a_1, a_2, \ldots$ the supremum is

A) 0 and it is attained B) 0 and it is not attained

C) 1 and it is attained D) 1 and it is not attained

71. The power series $\sum_{x=0}^{\infty} 3^{-n}(z-1)^{2n}$ converges, if

A) $|z| \leq \sqrt{3}$ B) $|z| < \sqrt{3}$ C) $|z-1| < \sqrt{3}$ D) $|z-1| \leq \sqrt{3}$

72. The distance between the origin and the point nearest to it on the surface $z^2 = 1 + xy$ is

A) 1 B) $\frac{\sqrt{3}}{2}$ C) $\sqrt{3}$ D) 2

73. If $f(x) = \begin{cases} \frac{\sin[x]}{[x]}, & [x] \neq 0 \\ 0, & [x] = 0 \end{cases}$ where $[x]$ denotes the greatest integer less than or equal to x, then $\lim_{x \to 0} f(x)$ is

A) 1 B) 0 C) -1 D) None of these

74. If $f(x) = (x^2 - 1)|x^2 - 3x + 2| + \cos(|x|)$, then set of point of non-differentiability is

A) {0,1,2} B) {1,2} C) {0,2} D) {2}

75. The function y= $|\log x|$ is

A) Discontinuous at x=1
B) Differentiable at x=1
C) Not differentiable at x=1
D) None of these

x-x-x

MSc(HS)(Physics/Medical Physics/Physics & Electronics)

1. In the Michelson interferometer, the compensating plate is used for
   A) Inducing symmetry in the optical elements.
   B) Compensating the extra path traversed by reflected waves after splitting of beam.
   C) Getting circular shape of interference fringes.
   D) Replacing bright central fringe with dark one.

2. The output of the Nicol prism, when monochromatic natural light is incident on it, is
   A) Ordinary ray with vibrations perpendicular to optic axis of crystal.
   B) Extraordinary ray with vibrations parallel to optic axis of crystal
   C) Extraordinary ray with vibrations perpendicular to optic axis of crystal.
   D) Ordinary ray with vibrations parallel to optic axis of crystal.

3. The role of Helium atoms in the He-Ne laser is to
   A) Help in excitation and population inversion of Neon atoms.
   B) Help in maintaining optical resonance.
   C) Result in the emission of red colour light.
   D) Absorb the light of colours other than red.

4. A thick sheet of glass 3.7μm is placed in the path of one of the interfering beams, of the wavelength 550nm, in the Fresnel biprism arrangement. If the central maximum is shifted to the position earlier occupied by the 5^{th} bright fringe, the refractive index of the sheet is
   A) 1.65 B) 1.54 C) 1.74 D) 1.43

5. Calculate the radius of 3^{rd} half period zone of the zone plate of focal length 1.5m illuminated by light of wavelength 593nm
   A) 2.04mm B) 1.98mm C) 1.07mm D) 1.63mm

6. A parallel beam of monochromatic light of wavelength 500nm is incident normally on a plane diffraction grating having 4000 lines per centimetre. The angle of diffraction for first order principal maxima is given by
   A) $\sin\theta = 0.5$ B) $\sin\theta = 0.7$ C) $\sin\theta = 0.2$ D) $\sin\theta = 0.1$

7. The interference differs from the diffraction in that
   A) It can be observed with white light
   B) Unlike diffraction the interference fringes are of varying intensity
   C) Interference minima are perfectly dark but that of that of diffraction are not so
   D) The diffraction fringes are of equal width but interference fringes are of unequal width

8. Which of the following is not an experimental technique to obtain a polarised beam of light
   A) Dichorism B) Reflection from a clear liquid surface
   C) Interference by division of wave front D) Double refraction

9. A ray of light strikes a glass plate at an angle of 60^o. If the reflected and refracted light are perpendicular to each other, the refractive index of the glass is

A) 1.33 B) 2.14 C) 1.97 D) 1.73

10. Which of the following is not a characteristic of a under-damped oscillating systems :

A) Frequency of oscillations is lower than that for free oscillator
B) Amplitude of oscillations decreases with each oscillation
C) Energy of the oscillating systemis conserved throughout the oscillation
D) Dissipative forces are smaller than the restoring forces

11. Calculate the maximum current in the RC harmonic oscillator consisting of inductance of 0.2mH and capacitance of 5.12μF, when maximum voltage across the capacitor is 0.1V.

A) 16mA B) 8mA C) 4mA D) 10mA

12. The forced series LCR electrical oscillator is not characterised by which of the following properties

A) At resonance, the inductive and capacitive reactance counterbalance each other.
B) The current is maximum at resonance.
C) The power absorption from source is minimum at resonance.
D) Oscillation frequency solely depends upon inductance and capacitance at resonance.

13. When electromagnetic wave propagates through a dielectric medium, then

A) Electric and magnetic fields oscillate in phase and with same frequency.
B) Electric and magnetic fields oscillate in phase but not with same frequency.Magnetic
C) Field oscillates with a phase lag relative to electric field.
D) Electric field oscillates with a phase lag relative to magnetic field.

14. The relative permittivity of the medium is 3.24. The refractive index of this medium will be:

A) 2.2 B) 1.8 C) 1.6 D) 2.0

15. The Poynting vector associated with an electromagnetic wave informs about:

A) Power flux and direction of propagation of EM wave.
B) Frequency of EM wave.
C) Rate of oscillations of electric and magnetic field intensities.
D) Dispersive power of the medium through which EM wave is propagating.

16. The electric field intensity (in SI units) inside a charged spherical shell of radius 15m and surface charge density 15μC per m^2 is

A) 1 B) 1/15 C) 0 D) 15

17. The electric lines of force at any point on the equipotential surfaces

A) Are parallel to it B) Are inclined at acute angles.
C) Are normal to it D) Are inclined at obtuse angles

18. A current of 10A flows through a conductor of cross-section $1mm^2$. If the density of charge carriers is $10^{21}cm^{-3}$, then the drift velocity of electrons is

A) 6.25cm/s B) 6.25mm/s C) 62.5m/s D) 0.625mm/s

19. The resistivity of conductor increases with temperature because of
A) Decrease of relaxation time B) Increase in relaxation time
C) Increase in mean free path of electrons D) Increase in charge carrier density.

20. The magnetic field intensity due to a long current carrying solenoid is proportional to
A) Inversely proportional to current
B) Directly proportional to number of turns of wire
C) Independent of permeability of core introduced
D) Inverse proportional to permeability of core

21. Which of the following processes makes use of electromagnetic induction
A) Charging a storage battery.
B) Magnetising an iron piece with a bar magnet.
C) Generation of hydroelectricity.
D) Magnetising a soft iron piece by placing inside a current carrying solenoid.

22. The ratio E(axial)/E(Equatorial) between axial and equatorial electric fields due to a short electric dipole is
A) 1.5 B) 2.0 C) 1.0 D) 0.5

23. Two streams of electrons moving parallel to each other in the same direction
A) Attract each other B) Repel each other
C) Cancel the electric field of each other D) Cancel the magnetic field of each other

24. The ferromagnetic materials are characterized by
A) Negative value of susceptibility
B) Small but positive value of susceptibility
C) Large positive value of susceptibility
D) Zero value of susceptibility

25. An electric dipole is place in uniform electric field, it is acted upon by:
A) A force and a torque B) Neither a force nor a torque
C) A torque only D) A force only

26. A bar magnet is cut into two equal pieces. The pole strength of either piece will be
A) Halved B) Unchanged C) Doubled D) Reduced to zero

27. Ferrites are the materials, which are not characterized by
A) Negative electrical conductivity
B) Rectangular shaped hysteresis loop
C) High Joule's heating on current flow
D) Two sub-lattices with unequal and opposite magnetic moments

28. To shield an instrument from the external magnetic field, it may be placed in the cabinet made of

A) Wood B) Ebonite C) Metal D) Diamagnetic substance

29. In a region where electric field is 5N/C, 40 lines of electric force are crossing per m^2. The number of lines crossing per m^2, where the electric field intensity is 10N/C will be;

A) 20 B) 80 C) 100 D) 200

30. The length of the meter stick moving parallel to its length, when its mass is 1.5 times its rest mass, is

A) 150cm B) 66.7 cm C) 75cm D) 125cm.

31. The planets revolving around the sun in the solar system obey the law, relating their time period of revolution and average radius of orbit, which can be expressed as:

A) $T \propto r^3$ B) $T^2 \propto r^3$ C) $T^2 \propto r^5$ D) $T \propto r$

32. The aircraft at take off stage is an example of

A) Inertial reference frame B) Non-inertial reference frame

C) Universal reference frame D) Stationary frame

33. The radius of carbon atom in the diamond crystal structure having cubic unit cell edge $16\sqrt{3}$ nm is

A) 6nm B) 8nm C) $16\sqrt{3}$ nm D) $8\sqrt{3}$ nm

34. The continuous component x-ray spectrum owes its origin to

A) Photoelectric effect B) Bremmstrahlung.

C) Pair production D) Compton effect

35. The well-defined wave function must not be

A) Single valued B) Continuous w.r.t space coordinates

C) Obey the principle of superposition D) Always areal function

36. The moving particle confined in an infinite potential well is not characterised by which of the following:

A) Quantized negative energy states

B) Ground state is not the state of rest

C) Quantized wave functions defining different probability distribution for the particle

D) Quantized positive energy states

37. Which of the following energy terms does not contribute in the binding energy formula derived using liquid drop model for nucleus:

A) Surface energy B) Asymmetry energy

C) Heisenberg Exchange energy D) Coulomb's energy.

38. For the alpha decay from natural radionuclides, which of the following observations does not hold true:

A) The emission of alpha particle takes place following tunnelling of barrier.

B) The energetic alpha particles are emitted by radionuclide with shorter half life.

C) The energy required by alpha particle to penetrate a radionuclide is much smaller than the kinetic energy of alpha particle emitted by that radionuclide.

D) The alpha decaying radionuclides have mass number greater than 200.

39. Which of the following properties is not associated with the neutrino particle

A) Nearly zero mass B) No charge C) Integral spin D) Spin=1/2.

40. A radioactive specimen, consisting of 10000 active atoms, has a half life of 1 hour. How many radioactive atoms will be left in the specimen after a duration of 3hours

A) 1250 B) 5000 C) 2500 D) 7500

41. Quadrupole moment of a doubly magic nucleus is always

A) Positive but small B) Negative but large

C) Zero D) Positive and large

42. The radius of $^{8}Be_{4}$ nucleus is 2.4fm. The radius of $^{27}Al_{13}$ nucleus will be:

A) 4.8fm B) 3.6fm C) 3.0 fm D) 4.2fm

43. The kinetic energy of each of the electron and positron generated in the pair production of photon having energy of 1.522MeV will be

A) 756KeV B) 250KeV C) 400KeV D) 150KeV

44. A photon of 45 pico-meter wavelength undergoes scattering by loosely bound electron nearly at rest. The maximum wavelength of the scattered photon will be

A) 45.0 pico-meter B) 47.4 pico-meter C) 49.8 pico-meter D) 48.2 pico-meter

45. The photoelectric emission of K-shell electron, with binding energy of 3.2eV, is caused by a 6.5keV photon. The kinetic energy of emitted electron is:

A) 9.7keV B) 4.9keV C) 3.3keV D) 3.2keV.

46. The atomic packing fraction of face-centred cubic is

A) $\frac{\pi}{3\sqrt{2}}$ B) $\frac{\pi}{\sqrt{2}}$ C) $\frac{\pi\sqrt{2}}{3}$ D) $\frac{3\pi}{\sqrt{2}}$

47. Number of atoms per unit cell in case of body-centred cubic is

A) 2 B) 1 C) 3 D) 4

48. For the Van der waal's force, the dependence of the interaction energy on distance r is proportional to

A) $\sim r^{-6}$ B) $\sim r^{-7}$ C) $\sim r^{-3}$ D) $\sim r^{2}$

49. A ^{214}Pb (Z = 82) nucleus decays via two β^- decays and one alpha decay, the resulting nucleus is

A) ^{210}Pb B) ^{210}Bi C) ^{210}Au D) ^{210}Pt

50. Miller indices of the plane parallel to the x-axis and y-axis are
A) (0,0,1) B) (1,0,0) C) (0,1,0) D) (1,1,0)

51. In case of a system of identical, indistinguishable particles obeying Pauli exclusion principle, the number of particles in each energy state ε at the temperature T is proportional to (k is Boltzmann constant and ε_f is the Fermi energy)

A) $\frac{1}{\exp[(\varepsilon-\varepsilon_f)/kT]+1}$ B) $\frac{1}{\exp[(\varepsilon-\varepsilon_f)/kT]-1}$

C) $\frac{1}{1-\exp[(\varepsilon-\varepsilon_f)/kT]}$ D) $\frac{1}{\exp[\varepsilon/kT]+1}$

52. In an p-type Silicon, which of the following statements is true:
A) Electrons are majority carriers and pentavalent atoms are the dopants
B) Electrons are minority carriers and pentavalent atoms are dopants.
C) Electrons are minority carriers and trivalent atoms are the dopants
D) Electrons are majority carriers and trivalent atoms are the dopants

53. In full wave rectifier with input frequency of 50 Hz, the frequency of the output is
A) 50 Hz B) 100 Hz C) 150 Hz D) 200 Hz

54. For a transistor amplifier, the voltage gain
A) Remains constant for all frequencies
B) Is high at high and low frequencies and constant in middle frequencies
C) Is low at high and low frequencies andconstant middle frequencies
D) Is continuously decreasing with frequency

55. In case of the transistor connected in the common emitter configuration, the input resistance is defined as ratio of
A) Change in V_{CE} and to change in V_{BE}, with I_B kept constant.
B) Change in V_{CE} and to change in I_C, with $I_B$kept constant.
C) Change in V_{BE} and to change in V_{CE}, I_B with kept constant.
D) Change in I_B and to change in V_{BE}, with V_{CE} kept constant.

56. Two amplifiers are connected one after the other in series. The first amplifier has a voltage gain of A_1 and the second has a voltage gain of A_2. The overall gain of the combination will be
A) A_1A_2 B) $A_1 + A_2$ C) $A_1 - A_2$ D) A_1/A_2

57. The least preferred principal crystal structures for themetallic crystals is:
A) Simple cubic B) Body centred cubic

C) Face centred cubic D) Hexagonal

58. The base of an npn transistor is
A) Heavily doped B) Lightly doped
C) Metallic D) Doped by pentavalent material

59. A reverse voltage of 10 V is applied across a Si diode. The magnitude of voltage across the depletion layer will be
A) 0 V B) ~ 0.7 V C) ~ 10 V D) ~ 1.1 V

60. The thermally generated electrons and holes acquire sufficient energy from the applied potential to produce new carriers by removing valence electrons from their bonds. These new carriers in turn produce additional carriers again through the process of disrupting bonds. The cumulative process is referred to as
A) Avalanche breakdown B) Zener breakdown
C) Avalanche multiplication D) Zener multiplication

61. The basic Collpitts oscillator uses
A) Two inductor and one capacitors B) One inductor and two capacitors
C) Two capacitors D) Tickler coil

62. The light emitted diodes consist of
A) GaAs B) GaInP C) GaAlInP D) InAs

63. VLSI circuits are integrated circuits having
A) More than 10 gates B) More than 1000 gates
C) More than 100 gates D) No gate

64. The possible values of the total angular momentum quantum number J under LS coupling of two atomic electrons whose orbital quantum numbers are $l_1 = 1$ and $l_2 = 2$ are
A) 1,2,3 B) 0,1,2,3,4 C) 0,1,2,3 D) 2,3,4

65. The barn unit of cross section is equal to
A) 100 fm^2 B) 10^{-28} fm^2 C) 10^{-24} fm^2 D) 10^{-15} m^2

66. A force $F = (4\hat{i} - 2\hat{j} + 3\hat{k})$ N is applied at the point B (5,-1,3) of a body which rotates about an axis through the point A (1,2,-1). Position coordinates are expressed in meters. Then the torque acting on the body is
A) $(-\hat{i} - 4\hat{j} + 4\hat{k})$ N m B) $(-\hat{i} + 4\hat{j} - 4\hat{k})$ N m
C) $(-\hat{i} + 4\hat{j} + 4\hat{k})$ N m D) $(\hat{i} + 4\hat{j} + 4\hat{k})$ N m

67. A body of mass 1 kg having velocity $v_1 = (5\hat{i} - 4\hat{j} + 3\hat{k})$ m/s at $r_1 = (4\hat{i} + 6\hat{j} - 2\hat{k})$ m is moved to position $r_2 = (5\hat{i} + 8\hat{j} + \hat{k})$ m along a straight line by force $F = (2\hat{i} - 3\hat{j} + 4\hat{k})$ N. The work done in moving the particle is
A) 8 J B) 12 J C) 16 J D) 9 J

68. An alternating current is given by $\left(\sqrt{3}\sin\omega t+\cos\omega t\right)$. The root mean square value of the current is

A) 2 B) $\left(\sqrt{3}\sin\omega t+\cos\omega t\right)$ C) $\sqrt{2}$ D) 4

69. A particle is limited to the x-axis has the wave function ψ = a x between x = 0 and x =1; and ψ = 0 elsewhere. The expectation value of the particle position is

A) a B) $a^2/3$ C) 3/4 D) $a^3/4$

70. The value of divergence of curl of vector A is

A) Gradient of A B) Laplacian of A C) 0 D) Infinity

71. Four level lasers are preferred because their

A) Population inversion can be achieved only under intense pumping conditions
B) Wavelength of output laser is always low
C) Population inversion can be easily achieved and also sustained
D) None of these

72. The relationship between energy (E) and momentum (p) of a massless particle is

A) $E = pc^2$ B) E=p/c C) E= pc D) $E=mc^2$

73. The average energy of a molecule of *HCl* gas exhibiting translation, rotation and vibration motion is (*k* is Boltzmann constant and T is absolute temperature)

A) 3/2 *k*T B) 5/2 *k*T C) 7/2 *k*T D) 9/2 *k*T

74. In which of the following heat loss is primarily not due to convection

A) Boiling of water
B) Land and sea breeze
C) Heating of glass surface of a bulb due to current in filament
D) Circulation of air around blast furnace

75. In the adiabatic expansion of gas

A) Pressure increases B) Temperature falls
C) Density increases D) Thermal energy increases

x-x-x

MSc(2Yr)(Bioinformatics/System Bio. & Bio.Informatics)

1. Given below are three statements related to antibodies.
i) Binds to Fc receptors on mast cells.
ii) Important mediator for hypersensitivity
iii) Least abundant isotype in serum
Identify to which type of antibody these statements will hold true.
A) IgA B) IgD C) IgE D) IgM

2. A semiconductor memory that stores information permanently and does not lose its content when power is switched off will be
A) Random Access Memory B) Read only Memory
C) Records D) Register

3. Agarose is a polymer composed of repeating units of
A) A monosaccharide, galactose
B) A monosaccharide, 3,6 -anhydrogalactose
C) A disaccharide consisting of two galactose units
D) A disaccharide consisting of galactose and 3,6 -anhydrogalactose

4. Which of the following is a character based phylogenetic algorithm?
A) Neighbor joining B) Kimura
C) Maximum Likelihood D) UPGMA

5. Which of the following electrophoresis type cannot be used for immunoelectrophoresis?
A) Zone electrophoresis.
B) Dot blotting
C) Ouchterloney double diffusion
D) Orthogonal field alternating gel electrophoresis

6. Which of the following enzymes category catalyzes reaction where bond formation is coupled with ATP hydrolysis
A) Lyases B) Oxidoreductases C) Isomerases D) Ligases

7. The microarrays consist of a solid support with immobilized probes. Which of the following macromolecules can constitute these probes.
A) DNA B) mRNA C) Genes D) Transcripts

8. What is the major criterion for resolution in hydrophobic interaction chromatography?
A) Biospecific recognition B) Adsorption
C) Normal phase distribution D) Reverse phase distribution

9. Which are the most abundant RNA types?
A) rRNA and mRNA B) rRNA and microRNA
C) tRNA and mRNA D) mRNA and microRNA

10. Urea is used as denaturing agent for proteins and peptides during purification and isolation, it does so by all of the following properties, except?

A) Decreases hydrophobic interactions B) Disrupts hydrogen bonds
C) Disrupts ionic interactions D) Disrupts disulfide linkages

11. Hyperchromic shift on DNA molecules refers to

A) Increase in UV absorbance due to denaturation of DNA double helix
B) Increase in UV absorbance due to renaturation of DNA double helix
C) Increase in visible range absorbance due to denaturation of DNA double helix
D) Increase in visible range absorbance due to renaturation of DNA double helix

12. The terminology Scaffold in Genome sequencing project refers to

A) Ordered set of contigs placed on the chromosome
B) A contiguous stretch of sequence
C) A set of overlapping sequences
D) Sequence overlap information

13. All of the following statements are true for ribosome, except one

A) The ribosome binds mRNA molecules
B) The ribosome has specific binding sites for tRNA molecules
C) The ribosome cannot catalyze peptide bond formation
D) The ribosome undergoes movement to translate sequential codons

14. Match the cell type with correct receptor identified on their surface

a. Antigen presenting cell	1. $CD8^+$
b. B cell	2. MHC
c. Helper T cell	3. BCR
d. Cytotoxic T cell	4. $CD4^+$

A) a ,1; b, 2; c,3; d,4 B) a ,2; b, 3; c,4; d,1
C) a ,3; b, 2; c,1; d,4 D) a ,4; b, 2; c,3; d,1

15. Which one of the following statement is not true for Shine-Dalgarno Sequences?

A) These are purine rich tract of 3-10nucleotides.
B) It is centered ~10 nucleotides upstream from start codon.
C) Base pairing between this sequence and 16 S r RNA is crucial for translation initiation.
D) Complementary binding between this sequence and initiation factors is crucial for translation initiation.

16. In one litre of pure water HCl was added at H^+ conc. of 10^{-4} M. What will be the pH of solution?

A) 4 B) 6 C) 8 D) 10

17. All of the following enzymes exist as Zymogens, except

A) Trypsin B) Chymotrysin C) Elastase D) Acetylcholinestrase

18. All of the following amino acids have large and polar side-chains, except
A) Glutamine B) Histidine C) Lysine D) Leucine

19. A low molecular weight substance that can be made immunogenic by conjugation to a suitable carrier is termed as
A) Hapten B) Adjuvant C) Freund's adjuvant D) Inflammagen

20. In which of the mitotic phase, Golgi complex are reformed and daughter cells are formed
A) Interphase B) Anaphase C) Telophase D) Metaphase

21. An induced and ordered process in which the cell actively participitates in bringing out its own death is termed as
A) Necrosis B) Apoptosis C) Opsonization D) Autolysis

22. The bioinformatics program Clustal performs which type of multiple sequence alignments
A) Progressive B) Iterative C) Block-based D) Random

23. All of the following statements are true for enzyme kinetics, except
A) The maximal velocity of a reaction V_{max} occurs at high substrate concentration
B) The maximal velocity of a reaction V_{max} occurs at only high enzyme concentrations
C) The maximal velocity of a reaction V_{max} occurs when enzyme is saturated
D) The maximal velocity of a reaction V_{max} occurs when substrate is entirely in ES form

24. The acronym for the T-coffee program is
A) Tree-based consistency on function for alignment evaluation
B) Tree-based consistency objective function for e -value evaluation
C) Tree-based consistency objective function for alignment evaluation
D) Tree-based consistency on function for alignment and e-value evaluation

25. The translocon embedded in ER membrane is a channel for
A) Inward Transport of Ca ions
B) Outward Transport of Ca ions
C) Inward Transport of Nascent polypeptides
D) Outward Transport of Nascent polypeptides

26. The terminal signal in a flowchart represents
A) Processing B) Decision C) Start and End D) Debugging

27. Identify which one out of the following does not represent a subtype of printers
A) Ink-Jet B) Daisy Wheel C) Laser D) Dot pitch

28. A terabyte comprises of which of the following
A) 1024 gigabyte B) 1024 megabyte C) 1024 kilobyte D) 1024 byte

29. The correct definition for a PAM unit would be
A) One mutation per 100 amino acid residues
B) One mutation per 100nucleotides only

C) One amino acid only
D) One nucleotide only

30. The disorganization of a protein termed denaturation can be brought by all of the following agents , except

A) Radiations B) Heat C) Urea D) Proteases

31. The operating system that is self-contained in the device and resident in ROM is

A) Batch processing operating system B) Real -time operating system
C) Embedded operating system D) Multiprocess operating system

32. In the glycolytic cycle which of the following set of enzymes are ATP utilizing enzymes

A) Hexokinase and Pyruvate Kinase
B) Hexokinase and Phosphofructo kinase
C) Phosphoglycerate kinase and Pyruvate Kinase
D) Phosphoglycerate kinase and phospho fructokinase

33. The term cDNA is used for describing which of the following?

A) A modified conformation form of DNA
B) A complimentary DNA made against mRNA template
C) A complimentary DNA made against DNA template
D) A complimentary DNA made against Protein template

34. Which of the following mentioned program is for protein secondary structure prediction by *ab-initio* approach.

A) Chou-Fasman method B) Needleman-Wunsch method
C) Bayesian method D) Markov model method

35. In a BLAST search the list of words extracted from the query sequence is called as

A) Tupple B) Guide C) Score D) Seeding

36. For a database the term data integrity refers to

A) No duplication of data B) Accuracy of data
C) Security of data D) Centralization of data

37. All of the following statement are true for Low complexity regions, except

A) Sequence regions with highly repetitive residues
B) Short repeat segments of sequence
C) Sequence regions over-represented by a small number of residues
D) Sequence regions under-represented by a small number of residues

38. All of the following names are abbreviated names of sequence formats, except

A) GenBank B) GenPept C) FASTA D) BLAST

39. Which of the following is the correct name of the first bioinformatics database developed by Margaret Dayhoff

A) Atlas of Protein Sequence and Structure
B) Atlas of Protein Structure

C) Atlas of Nucleotide Sequence and Structure
D) Atlas of Nucleotide Sequence

40. The protein structures from secondary to quaternary are maintained by various types of stabilizing forces. All of the following mentioned are examples of these forces, except one.

A) Electrostatic interactions B) Van-der Waals forces
C) Hydrogen bonding D) Peptide bonds

41. Majority of the protein glycosylation takes place in which of the cellular organelle.

A) Ribosomal assembly B) Peroxisomes
C) Golgi complex D) Endoplasmic reticulum

42. A Monochromator is used in a spectrophotometer for which of the following mentioned functions

A) To create a straight beam of light
B) To create a source of light
C) To select a source of light from different sources
D) To select a light beam of desired wavelength

43. How many base pairs are present in a helix in A-DNA?

A) 9 B) 10 C) 11 D) 12

44. Which of the following best describe the antibodies

A) Fibrous proteins B) Prion proteins C) Globular proteins D) Synaptic proteins

45. Allergic reaction in an organism is due to production of which of the following types of Antibodies against an antigen

A) IgG B) IgA C) IgD D) IgE

46. Identify which of the following amino acid has a hydrophobic side chain?

A) Asparagine B) Lysine C) Leucine D) Glycine

47. The cells which have potency to divide and develop to form an entire organism are known as

A) Totipotent cells B) Multipotent cells C) Unipotent cells D) Pleuripotent cells

48. A computer network, which spans over a large geographical area, is termed as

A) LAN B) WAN C) Hub D) Router

49. A genetic disorder Phenylketonuria is due to the deficiency of which one of the following enzymes

A) Phenylalanine hydroxylase B) Phenylalanine keto reductase
C) Phenylalanine oxidase D) Phenylalanine synthase

50. The Sodium dodecyl sulphate Polyacrylamide Gel Electrophoresis resolves proteins and polypeptides based on

A) Electric Charge B) pH

C) Molecular Weight D) Molecular Shape

51. According to Enzyme classification nomenclature the Enzyme Glucokinase belongs to which category

A) Isomerase B) Transferase C) Hydrolase D) Oxidoreductase

52. All the molecules mentioned hereby are nucleoside, except one of these. Identify that molecule.

A) Adenosine B) Cytosine C) Guanosine D) Uridine

53. A tRNA containing UAC anticodon will be base pair with which of the following codon

A) GUA B) AUG C) UAC D) CAU

54. The genetic variations present in at least one per cent of the population will be termed as

A) Copy number variation B) Single nucleotide polymorphism
C) Gene variant D) Mutation

55. In order to identify the protein in main protein database corresponding to the DNA sequence provided, which program should you use .

A) Blastn B) Blastp C) Blast D) Tblastn

56. In a typical PCR each cycle has multiple steps. Identify the correct number and order of steps

A) Two steps, denaturation then renaturation
B) Two steps, renaturation then denaturation
C) Three steps, denaturation, renaturation and synthesis
D) Three steps, renaturation, denaturation and synthesis

57. Which of the following organisms was completely sequenced and when?

A) *Haemophilus influenzae* in 1995 B) *Haemophilus influenzae* in 2001
C) *Escherichia coli* in 1995 D) *Escherichia coli* in 2001

58. Following are the examples of score matrices to calculate alignment of protein sequences, except

A) PAM B) BLOSUM C) Gonnet D) Pfam

59. The FASTA sequence format uses the following symbols

A) '>' for beginning of sequence, '|'for extra information
B) '<' for beginning of sequence, '|'for extra information
C) 'l'for beginning of sequence, '>' for extra information
D) 'l' for beginning of sequence, '<' for extra information

60. The technique abbreviated as RT-PCR stands for

A) Reverse transcription -polymerase chain reaction
B) Reverse transcriptase- polymerase chain reaction
C) Reciprocal transcription- polymerase chain reaction
D) Reciprocal transcriptase-polymerase chain reaction

61. The fastest memory in a computer system is

A) RAM B) ROM C) RM D) Cache

62. The eukaryotic cytoskeleton is constituted by all of the following components, except.

A) Intermediate filaments B) Spiral filaments

C) Actin filaments D) Myosin filament

63. Which of the following is the cofactor for enzyme of DNA replication?

A) Mg^{2+} B) Ca^{2+} C) Co^{2+} D) ATP

64. The process of erasing data on a CD-RW disk is called

A) Peeling B) Annealing C) Scrapping D) Smoothening

65. How many bases are known to constitute the Human genome?

A) 3 million base pairs B) 3 billion base pairs

C) 4 million base pairs D) 4 billion base pairs

66. Which of the following databases can be used for submission of the sequence of a newly identified gene.

A) A Primary database B) A Secondary database

C) BLAST D) Any genome browser

67. All of the following biochemical processes are responsible for post –translational Modifications in proteins, except?

A) Amino acid residues modifications B) Formation of disulfide bonds

C) Proteolytic cleavage D) Formation of peptide bonds

68. Which of the following set of databases represent literature databases

A) MEDLINE and PubMed B) MEDLINE and PDB

C) PDB and PubMed D) SCOPUS and PDB

69. All of the statements are true for plasmids except one. Identify the false statement

A) They are circular DNA molecule

B) They have antibiotic resistance gene

C) They have the ability of self-replication

D) The size of plasmid is as big as that of chromosomal DNA

70. The DNA molecule differs from RNA in all of the following ways except, one?

A) Presence of thymine

B) A sugar molecule

C) Functions performed by each of these molecules

D) The 5' and 3' orientation of the polynucleotide strand

71. Sucrose is a disaccharide of glucose and fructose linked by

A) α, β (1 → 2)glycosidic bond B) α, β (1 → 3)glycosidic bond

C) α, β (1 → 4)glycosidic bond D) α, β (1 → 6)glycosidic bond

72. The sample of purified DNA can be checked quantitatively for yield by which of the following methods.

A) Spectrophotometrically taking absorption at 260nm
B) Spectrophotometrically taking absorption at 280nm
C) Performing agarose gel electrophoresis
D) Performing acryl amide gel electrophoresis

73. The alpha helical stability of a protein molecule can be disrupted by all of the following , except.

A) Presence of proline in the sequence
B) Bulky side chains of aromatic amino acids
C) Branched chain amino acids
D) Presence of alanine in the sequence

74. The program ORF Finder identifies all ORFs using.

A) Only one standard genetic code for each amino acid
B) Any genetic code for an amino acid
C) Either standard or alternative genetic codes for each amino acid
D) Special codes assigned to each amino acid

75. The essential feature of a cloning vector is.

A) It should have a strong promoter
B) It should have a terminator region
C) It should have a marker gene
D) It should have b-galactose gene

x-x-x

MSc(HS/2Yr)(Botany)

1. The grain of maize is:
A) Achene B) Caryopsis C) Cypsella D) Nut

2. Based upon duration, the sepals falling down immediately after the opening of flower are:
A) Accrescent B) Caducous C) Deciduous D) Marcescent

3. The law of inheritance of acquired characters was postulated by:
A) Charles Darwin B) Hugo de Vries
C) Lamarck D) G.J. Mendel

4. In *Nepenthes*, the pitcher is a modification of:
A) Leaf base B) Petiole C) Lamina D) Stipules

5. The type of compound leaves in *Coriander* is:
A) Unipinnate B) Bipinnate C) Tripinnate D) Dcompound

6. In Australian *Acacia*, the leaves are modified into:
A) Cladodes B) Phylloclades C) Phyllodes D) Tendrils

7. The stiff and pointed structures in *Bougainvillea* are called:
A) Thorns B) Spines C) Prickles D) Bristles

8. Which of the following diseases is caused by bacteria?
A) Late blight of Potato B) Powdery mildew of wheat
C) Citrus canker D) Tobacco mosaic

9. Fleshy leaf like structures in *Opuntia* is a modification of:
A) Root B) Flower C) Petiole D) Stem

10. Root cap is absent in:
A) *Zea mays* B) *Helianthus* C) *Nymphaea* D) *Azolla*

11. Involucral bracts are present in:
A) Nut B) Capitulum C) Spadix D) Catkin

12. Red tides are caused by the rapid multiplication of:
A) *Nostoc* B) *Euglena* C) *Cosmarium* D) *Gonyaulax*

13. Numerical Taxonomy is based on:
A) Vegetative and asexual characteristics
B) Sexual characteristics
C) Evolutionary relationships
D) All observable characteristics

14. Grinding of spices breaks down or exposes the tissues with inevitable loss of:

A) Colour Principles B) Aromatic principles
C) Moisture principles D) Weight principles

15. The permanent taste in ginger is due to:

A) Oil B) Minerals C) Resins D) Starch

16. The quality of coffee mainly depends upon:

A) Harvesting B) Processing
C) Physiological maturity D) Ripening

17. The literal meaning of word 'Locust' is:

A) Location B) Area C) Pests D) Plague

18. Companion cells are derived from:

A) Parenchyma B) Fibres C) Sclerotic cellsD) Sieve elements

19. A dew drop at the tip of tomato leaves on cool night is formed due to:

A) Atmospheric water B) Evaporation of water from stomata
C) Secretion of water from hydathodes D) Excessive water absorption at the root tips

20. Stone cells are also known as:

A) Brachysclereids B) Osteosclereids
C) Macroschereids D) Trichoblasts

21. Cells entirely lacking turgor pressure are referred to as:

A) Dead B) Inactive C) Flaccid D) Immotile

22. In plant physiology, radioactive isotopes are used as:

A) Tracers B) Activators C) Catalysts D) Initiators

23. The tendency of colloidal particles to attract and retain other particles at their surface is:

A) Adsorption B) Absorption C) Gelation D) Solation

24. Ammonia poisoning occurs in temperature sensitive plants at:

A) Low temperature B) High temperature
C) Moderate temperature D) Low light intensity

25. Which of the following is more resistant to high temperature stress:

A) Low hydrated tissues B) Moderate hydrated tissues
C) High hydrated tissues D) Very high hydrated tissues

26. Opening and closing of flowers represents a kind of:

A) Autonomic movement B) Nutation
C) Tropic movement D) Nastic movement

27. The scutellum of grass embryo is:

A) Photosynthetic organ B) Absorption organ
C) Reserve food storage organ D) Vestigeal organ

28. During germination of barley, the enzyme α-amylase is secreted by:

A) Seed coat B) Aleurone layer
C) Coleorhizae D) Coleoptiles

29. In the respiratory chain of electron transport, which one of the following is the terminal cytochrome that reacts with oxygen?

A) Cytochrome b B) Cytochrome b_6 C) Cytochrome c D) Cytochrome a_3

30. Which of the following enzyme has a dual role?

A) PEP carboxylase B) RuBisCo
C) Phosphorylase D) Aldolase

31. Which of the following does not require carrier molecules during transport through cell membranes?

A) Simple diffusion B) Facilitated diffusion
C) Na^+- K^+ transport D) Active transport of sugars and amino acids

32. Which one of the following features is NOT found in meristematic cells?

A) Dense cytoplasm B) Isodiametric shape
C) Large prominent nucleus D) Thick cell-wall due to lignification

33. Zymogens are:

A) Enzyme inhibitors B) Enzyme solvents
C) Chemical precursors of enzymes D) Active enzymes

34. Which of the following are important for nitrogen fixation?

A) Calcium and potassium B) Sodium and phosphorus
C) Magnesium and boron D) Iron and molybdenum

35. Statocysts are:

A) Air-cells B) Chlorophyll cells
C) Fibre-cells D) Sensory cells

36. Movement induced by internal stimulus is known as:

A) Autonomic B) Paratonic C) Mechanical D) Independent

37. DNA replication in cell cycle occurs in which of the following phases?

A) Metaphase B) G_1 Phase C) S Phase D) G_2 Phase

38. Photorespiration is stimulated in:

A) Light B) Dark
C) A chamber devoid of CO_2 D) A chamber filled with CO_2

39. Deficiency of oxygen during mitosis:

A) Shortens the cycle period B) Extends the cycle period
C) Has no effect on the process D) Cause polyploidy

40. Reactive oxygen species are NOT found in:

A) Mitochondria B) Peroxisome C) Chloroplast D) Ribosomes

41. When *Hydrilla* is removed from aquatic habitat to be planted in soil:

A) The plant will dry up and die
B) The plant would grow though with a stunted growth
C) The number of lacunae reduce and a thick cuticle is developed
D) It start producing collenchyma and sclerenchyma cells for mechanical support

42. Dissociation constant (Kw) of water increases with:

A) Atmospheric pressure B) Temperature
C) Dilution D) Acid

43. Red Data Book gives information on:

A) Plants and animals found in Red sea B) Plants possessing red pigments
C) Plants threatened with extinction D) Effects of red light on photosynthesis

44. In gene banks, genetic material is in the form of:

A) Leaves B) Shoots C) Seeds D) Flowers

45. Which one of the following is the correct sequence of energy in an ecosystem?

A) Herbivore > Carnivore >Producer B) Producer > Herbivore > Carnivore
C) Producer > Carnivore > Herbivore D) Decomposer > Carnivore > Herbivore

46. Eutrophication is maximum in:

A) Upper layers of deep lakes B) Upper layers of shallow lakes
C) Bottom layers of shallow lakes D) Bottom layers of deep lakes

47. The gene which suppresses the action of a gene at other locus is called:

A) Lethal B) Penetrance C) Pleiotropic D) Epistatic

48. The chemical widely used for inducing polyploidy is:

A) Putrescine B) Spermidine C) Spermine D) Colchicine

49. Which of the following is not a type of direct gene transfer method:

A) Biolistic method B) Viral mediated

C) Electroporation D) Microinjection

50. *The enzymes present in the lysosomes are optimally active at the:*
A) *Basic pH* *B) Acidic pH* *C) Neutral pH* *D) All the pH ranges*

51. Ramachandran plot deals with the conformational studies of:
A) Carbohydrates B) *Proteins*
C) Lipids *D) Nucleic acids*

52. *Association of fungi with the roots of higher plants is known as:*
A) *Lichen* *B) Mycoplasma* *C) Mycorrhiza* *D)* Corallorhiza

53. Which of the following is a heterosporous genus?
A) Equisetum B) Salvinia C) Funaria D) Lycopodium

54. Agar, a commercial product used in ice-creams, is obtained from:
A) Gelidium B) Laminaria C) Porphyra D) Chlorella

55. Adventitious buds arise from the notches present at the margins of leaves in:
A) Ginger B) Agave C) Bryophyllum D) Water hyacinth

56. Loss of water from the leaves of plants in liquid phase is known as:
A) Transpiration B) Guttation C) Evaporation D) Diffusion

57. The inheritance of flower colour in dog flower is an example of:
A) True dominance B) Co-dominance
C) Incomplete dominance D) Maternal inheritance

58. The historic Convention on Biological Diversity (CBD) was held in:
A) Johannesburg B) New York C) Rio de Janeiro D) Kyoto

59. Chemical substances like nicotine, caffeine, quinine, strychnine and opium are produced by plants as a:
A) Defence B) Medicine C) Commercial item D) Food item

60. The detritus food chain begins with:
A) Producers B) Carnivores C) Herbivores D) Dead organic matter

61. A toxic insecticidal component produced by *Bacillus thuringiensis* is a:
A) Glycoside B) Lipid C) Protein D) Alkaloid

62. In the ribose moiety of a ribonucleoside, phosphorylation is possible only at _____ in the furanose ring formation.
A) C5' (one) position B) C1', C4' (two) positions
C) C2', C3' C5' (three) positions D) C1', C2', C3', C4', C5' (five) positions

63. In Isoelectric focusing, proteins are separated on the basis of:

A) Size
B) Relative content of positively charged residue
C) Relative content of negatively charged residue
D) Relative content of positively and negatively charged residue

64. _____type of vascular bundles is characterized by the occurrence of xylem and phloem at the same radius.
A) Conjoint B) Conjuctive C) Collateral D) Closed

65. Presence of vessels is a characteristic feature of:
A) Bryophytes B) Pteridophytes C) Gymnosperms D) Angiosperms

66. In most of the angiosperms, pollen grains are shed at:
A) 2-celled stage B) 3-celled stage C) 4-celled stage D) 5-celled stage

67. In which of the following plants, dioecy occurs?
A) Maize B) Banana C) Papaya D) Mango

68. There is net gain of _____ molecules of ATP during fermentation of one molecule of glucose.
A) 1 B) 2 C) 3 D) 4

69. _____ promote bolting in beet, cabbages and many plants with rosette habit.
A) Auxins B) Gibberellins C) Cytokinins D) Abscisic acid

70. Vertical distribution of different species occupying different levels in a biotic community is:
A) Alfa diversity B) Stratification C) Beta diversity D) Gamma diversity

71. _____ are the smallest living cells known that can survive without oxygen.
A) Archaebacteria B) Viruses
C) Cyanobacteria D) Mycoplasma

72. The network of hyphae is:
A) Sclerotium B) Mycelium C) Apothecium D) Acervulus

73. Which of the following is one of the tallest tree species in the world?
A) *Pinus* B) *Sequoia* C) *Cedrus* D) *Eucalyptus*

74. Bulliform cells are present only in:
A) Orchids B) Grasses C) Flowers D) Fruits

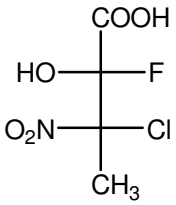
75. The oils and fats are stored in which of the following plastid types?
A) Amyloplsts B) Aleuroplasts C) Elaioplasts D) Chromoplasts

x-x-x

MSc(HS/2Yr)(Chemistry)

1. **Which of the following is most stable carbocation?**
   (A) $(C_6H_5)_3C^+$ (B) $C_6H_5CH_2^+$ (C) $(CH_3)_2CH^+$ (D) $CH_3CH_2^+$

2. **Assign *R* or/and *S* designation to the following molecule**



   (A) 2R, 3R (B) 2R, 3S (C) 2S, 3R (D) 2S, 3S

3. **The order of reactivity of halogen for the halogenations of alkanes follows the sequence**
   (A) $Cl_2 > F_2 > Br_2 > I_2$ (B) $Br_2 > F_2 > I_2 > Cl_2$
   (C) $I_2 > Br_2 > Cl_2 > F$ (D) $F_2 > Cl_2 > Br_2 > I_2$

4. **When propene is treated with chlorine at 773 K, reaction results in the formation of**
   (A) 1-Chloropropene (B) 2-Chloropropene
   (C) 3-Chloropropene (D) 1,2-Dichloropropene

5. **Reduction of vinyl acetylene with H_2 in presence of lindlar's catalyst produces**
   (A) Buta-1,3-diene (B) Penta-1,4-diene
   (C) Penta-1,3-diene (D) Buta-1,2-diene

6. **Treatment of benzene with ethyl bromide with anhydrous$AlBr_3$ gives**
   (A) Bromo benzene (B) Ethyl benzene
   (C) Toluene (D) 1-Phenyl-2 bromoethane

7. **SN_2 reactions in alkyl halidesfollow**
   (A) Second order kinetics (B) First order kinetics
   (C) Third order kinetics (D) Zero order kinetics

8. **Name the reaction which leads to following conversion**

$$R_2C{=}O + (CH_3)_2CHOH \xrightarrow{[(CH_3)_2CHO]_3Al} R_2CHOH + CH_3COCH_3$$

   (A) Birch reduction (B) Bouveault- Blanc reduction
   (C) Wolf-Kishner reduction (D) Meerwein-Poundroff-Verley reduction

9. **Hydrolysis of cumene hydroperoxide with dil. H_2SO_4gives**
   (A)Aniline and acetaldehyde (B) Phenol and acetone
   (C) Toluene and hydrogen peroxide (D) Anisole and benzene

10. Conversion of benzaldehyde to cinnamic acid using acetic anhydride in the presence of base can be termed as

(A) Aldol condensation (B) Benzoin condensation
(C) Perkin condensation (D) Knoevenagal condensation

11. $CH_3CH_2CONH_2$ can be transformed to $CH_3CH_2NH_2$ using reagent

(A) Br_2/ KOH (B) Br_2/P (C) Br_2/CCl_4 (D) PBr_3

12. 2-Bromo propionic acid reacts with alc. KOH and followed by hydrolysis to produce

(A) 2-Hydoxy propionic acid (B) Acrylic acid
(C) Bromoacetyl bromide (D) Acetic acid

13. How many NMR signals are expected in the NMR spectrum of *n*-propyl bromide?

(A) Four (B) Three (C)Two (D) Five

14. The C=O stretching absorption band in the infra-red spectra of acetophenone appears at

(A) 2200 cm^{-1} (B) 2860 cm^{-1} (C) 3100 cm^{-1} (D) 1705 cm^{-1}

15. Which of the following is cationic detergent?

(A) Cetyl trimethyl ammonium chloride (B) Sodium laury sulphate
(C) Polyethylene glycol (D) Lauryl alcohol ethoxylate

16. Oxidation of naphthalene with CrO_3/CH_3COOH at 298K affords

(A) Phthalic anhydride (B) Phthalic acid
(C) 1,4-Naphthaquinone (D) 1,4-Dihydronaphthalene

17. Glucose reacts with the following reagent to form the osazone

(A) HCN (B) $C_6H_5NHNH_2$ (C) HNO_3 (D) $(CH_3CO)_2O$

18. The transfer of excess energy from one molecule to another in environment all at once is called as

(A) Photo dissociation (B) Photo sensitisation
(C) Photo reduction (D) Photo isomerisation

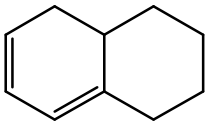
19. Shifting of the absorption maximum towards shorter wavelength in Ultra-Violet (UV) spectroscopy is known as

(A) Hypsochromic shift (B) Hypochromic shift
(C) Bathochromic shift (D) Hyperchromic shift

20. Pyrrole under catalytic reduction with Pd produces

(A) 2-Phenyl azopyrrole (B) Piperidine
(C) Pyrrolidine (D) Quinoline

21. Using Woodward–Fieser rules the λ_{max} for the following compound is



(A) 313 nm (B) 273nm (C) 253nm (D) 242nm

22. Degradation of alkaloids can be done by following method

(A) Zerewitnoff method (B) Kohn-Roth oxidation method
(C) Friedlander's method (D) Emde's method

23. When iodoform is heated with silver powder the product formed is

(A) Ethane (B) Ethene (C) Ethyne (D) Ethanol

24. Ethyl chloroformate on treatment with CH_3MgBr form an addition product which is unstable and gives

(A) CH_3CH_2OH (B) $CH_3COOC_2H_5$ (C) $ClCH_2COOH$ (D) CH_3COCl

25. For N-terminal residue analysis using Sanger's method, the peptide is initially treated with

(A) C_6H_5COCl (B) $C_6H_5N=C=S$ (C) $(NO_2)_2C_6H_3F$ (D) NH_2NH_2

26. For which one of the following ions, the colour is not due to d-d transitions:

(A) CrO_4^{2-} (B) $Cu(NH_3)_4^{2+}$ (C) $Ti(H_2O)_6^{3+}$ (D) CoF_6^{3-}

27. CO_2 has

(A) 3 vibrational modes (B) 4 vibrational modes, 2 of which are degenerate
(C) Stretching modes only (D) An IR active symmetric stretch

28. Which of the following molecules and ions have S_4 axis?

(A) SO_4^{2-} (B) BF_3 (C) C_2H_2 (D) CO_2

29. Crown ether and cryptate –

(A) Both have N and O donor atoms
(B) Both are polycyclic
(C) Have O and N donor atoms respectively
(D) Cryptate is a weaker complexing agent than crown ether

30. Which of the followings are isoelectronic and isostructural?

NO_3^-, CO_3^{2-}, ClO_3^-, SO_3

(A) NO_3^-, CO_3^{2-} (B) NO_3^-, SO_3 (C) CO_3^{2-}, ClO_3^- (D) CO_3^{2-}, SO_3

31. In a non-polar AX_2, the bond moment of AX is 0.56 D. The bond angle is

(A) 30^o (B) 45^o (C) 90^o (D) 180^o

32. Which one of these orders of acidic strength of hydrated cations is false?

(A) $[Fe(H_2O)_6]^{3+} > [Al(H_2O)_6]^{3+}$ (B) $[V(H_2O)_6]^{3+} > [La(H_2O)_6]^{3+}$
(C) $[Ba(H_2O)_n]^{2+} > [Be(H_2O)_n]^{2+}$ (D) $[Cu(H_2O)_n]^{2+} > [Ca(H_2O)_n]^{2+}$

33. The highest magnetic moment will be shown by
(A) Sc (B) Fe (C) Co (D) Ni

34. The orange colour of $Cr_2O_7^{2-}$ is due to
(A) Metal to ligand charge transfer transition
(B) Ligand to metal charge transfer transition
(C) Crystal field transition
(D) Charge transfer complex formation

35. Which one of the following has tetrahedral geometry:
(A) $[Co(NH_3)_6]^{3+}$ (B) $[Ni(CN)_4]^{2-}$ (C) $[Fe(CO)_6]$ (D) $[NiCl_4]^{2-}$

36. Which of the following does not obey EAN rule ?
(A) $[Cu(CN)_4]^{3-}$ (B) $[Pt(NH_3)_4]^{2+}$ (C) $[Pd(NH_3)_6]^{4+}$ (D) $[Cr(CO)_6]$

37. In a solid "AB" having NaCl structure "A" atoms occupy the corners of the cubic unit cell. If all the face-centred atoms along one of the axes are removed, then the resultant stoichiometry of the solid is
(A) AB_2 (B) A_2B (C) A_4B_3 (D) A_3B_4

38. The van der Waal's forces in halogen decreases in the order:
(A) $F_2 > Cl_2 > Br_2 > I_2$ (B) $I_2 > Br_2 > Cl_2 > F_2$
(C) $Br_2 > Cl_2 > F_2 > I_2$ (D) $Cl_2 > Br_2 > I_2 > F_2$

39. Dinitrogen tetroxide , N_2O_4, is a mixed anhydride because it:
(A) Is a mixture of N_2O_3 and N_2O_5
(B) Decomposes into two oxides of nitrogen
(C) React with water to form nitric acid
(D) React with water to form two acids

40. A magnetic moment of 1.73 B.M. will be shown by one among the following compounds:
(A) $[Ni(CN)_4]^{2-}$ (B) $[TiCl_4]$ (C) $[CoCl_6]^{4-}$ (D) $[Cu(NH_3)_4]^{2+}$

41. Alumina on heating with carbon in nitrogen atmosphere gives:
(A) Al + CO (B) Al + CO_2 (C) AlN + CO (D) Al + CO + N_2

42. P_4O_{10} has short and long P-O bonds. The number of short P-O bonds in this compound is:
(A) 1 (B) 2 (C) 3 (D) 4

43. CO_2 and N_2 are non- supporter of combustion. However, for putting out fires CO_2 is preferred over N_2 and CO_2:

(A) Does not burn
(B) Forms non-combustible products with burning substances
(C) Is denser than nitrogen
(D) Is a more reactive

44. Newly shaped glass articles when cooled suddenly become brittle, therefore these are cooled slowly, this process is known as:
(A) Tempering (B) Annealing (C) Quenching (D) Galvanising

45. Al_2O_3 formation involves large quantity of heat evolution which makes its use in:
(A) Deoxidiser (B) Confectionary
(C) Indoor photography (D) Thermite welding

46. Optical isomerism is shown by
(A) $[Ni(CO)_4]$ (B) $[Ni(CN)_4]^{2-}$ (C) $[Pt(NH_3)_4]^{2+}$ (D) $[Co(en)_3]^{3+}$

47. BrO_3^- is isostructural with a noble gas species
(A) XeO_3 (B) XeF_3 (C) XeF_4 (D) XeO_2

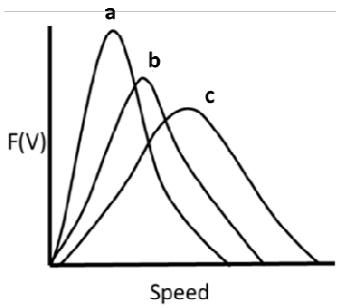
48. Which of the following is non-linear according to VSEPR theory?
(A) CO_2 (B) $[N_3]^-$ (C) $[I_3]^-$ (D) $[ClF_2]^+$

49. The styx code for diborane is
(A) 2020 (B) 2200 (C) 2002 (D) 0220

50. d-p mixing occurs in
(A) Tetrahedral complexes only (B) Octahedral complexes only
(C) Complexes with no centre of symmetry (D) Complexes with centre of symmetry

51. For any operator A and its adjoint $A^\dagger$, the incorrect statement is:
(A) $A\,A^\dagger$ is Hermitian (B) $A\,A^\dagger + A\,A^\dagger$ is hermitian
(C) $A+A^\dagger$ is hermitian (D) $A - A^\dagger$ is Hermitian

52.



At constant temperature, identify the correct match of speed distribution functions *w.r.t* Ne, Ar, and Kr with the curves in the figure above
(A) Ne-a, Ar-b, Kr-c (B) Ne-b, Ar-c, Kr-a
(C) Ne-c, Ar-b, Kr-a (D) Ne-c, Ar-a, Kr-b

53. Calculate the reduction potential of a half-cell consisting of platinum electrode immersed in 2.0 M Fe^{2+} and 0.02 M Fe^{3+}.
Given $E^o_{Fe^{3+}/Fe^{2+}}$ = 0.771 V
(A) 0.798 V (B) 0.889 V (C) 2.771 V (D) 0.652 V

54. Which of the following is not linear operators?
$\frac{d^2}{dx^2}\frac{d}{dx}$, √, x^2
(A) $\frac{d^2}{dx^2}$ (B) x^2 (C) √ (D)$\frac{d}{dx}$

55. The number of carbon atoms per unit cell of diamond unit cell is:
(A) 8 (B) 6 (C) 1 (D) 4

56. At 25°C the molar conductances at infinite dilution of CH_3COONa, HCl and NaCl are 91.0 x 10^{-4}, 426.16 x 10^{-4} and 126.45 x 10^{-4} S m^2 mol^{-1}, respectively. The Λ^o_m for CH_3COOH is
(A) 109.11 x 10^{-4} S m^2 mol^{-1} (B) 286.45 x 10^{-4} S m^2 mol^{-1}
(C) 191.74 x 10^{-4} S m^2 mol^{-1} (D) 390.71 x 10^{-4} S m^2 mol^{-1}

57. Match the type of colloidal systems given in column I and column II

Column – I	Column – II
(i) Solid in liquid	(a) Foam
(ii) Liquid in solid	(b) Sol
(iii) Liquid in liquid	(c) Gel
(iv) Gas in liquid	(d) Emulsion

(A)(i)-(b), (ii)-(c), (iii)-(d), (iv)-(a) (B) (i) -(c), (ii)- (b), (iii)-(a), (iv) -(d)
(C)(i)-(b), (ii)- (c), (iii)- (a), (iv) -(d) (D) (i)- (c), (ii)- (b), (iii)- (d), (iv)- (a)

58. Potential of hydrogen electrode at pH = 10 is :
(A) +0.59 V (B) 0.00 V (C) -0.59 V (D) -0.059 V

59. For an ideal solution which combination is correct (where ΔV_{mix} is volume change on mixing and ΔH_{mix} is enthalpy change on mixing)
(A) $\Delta V_{mix} > 0$, $\Delta H_{mix} > 0$ (B) $\Delta V_{mix} < 0$, $\Delta H_{mix} < 0$
(C) $\Delta V_{mix} = 0$, $\Delta H_{mix} = 0$ (D) $\Delta V_{mix} > 0$, $\Delta H_{mix} < 0$

60. Rust is a mixture of:
(A) FeO and $Fe(OH)_2$ (B) FeO and $Fe(OH)_3$
(C) Fe_3O_4 and $Fe(OH)_3$ (D)Fe_2O_3 and $Fe(OH)_3$

61. The heat capacity of 10 mol of an ideal gas at a certain temperature is 300 JK^{-1} at constant pressure. The heat capacity of the same gas at the same temperature and at constant volume would be (in JK^{-1})

(A) 299.10 (B) 46.63 (C) 216.86 (D) 0

62. The van der Waal's equation reduces itself to the ideal gas equation at:

(A) High pressure and low temperature
(B) Low pressure and high temperature
(C) Low pressure and low temperature
(D) Critical pressure and critical temperature

63. The Stark-Einstein law of photochemical equilibrium is defined as:

(A) $\Delta E = \frac{Nhc}{\lambda}$ (B) $\frac{N}{\lambda hc} = \Delta E$ (C) $\frac{\lambda}{hc} = \Delta E$ (D) $\frac{\Delta E}{\lambda} = Nhc$

64. A first order reaction takes 40 min for 30% decomposition.
Calculate $t_{1/2}$ (Given log 3 = 0.477, log 5 = 0.699 , log 7 = 0.845)

(A) 77.7 (B) 8.9 (C) 133.7 (D) 80.5

65. For the reaction at 527 ^{o}C

N_2 (g) + 3 H_2 (g) $\rightleftharpoons$ 2NH_3 (g)
The ratio of K_P and K_C is (R = 0.082 L atm mol^{-1} K^{-1})

(A) 3.23 x 10^{-6} (B) 2.32 x 10^{-4} (C) 2.32 x 10^{4} (D) 3.23 x 10^{6}

66. P.Q.R branches of spectral lines are observed in

(A) Vibrational spectrum of diatomic molecule
(B) Rotational spectrum of diatomic molecule
(C) Vibrational rotational spectrum of diatomic molecule
(D) Raman spectrum of diatomic molecule

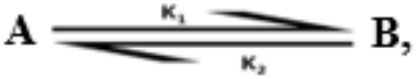
67. What is the log $\gamma_{\pm}$ value of aqueous solution of Na_2SO_4 of 0.001 molality at 25^{0}C? where $\gamma_{\pm}$ is mean ionic activity coefficient and for water at 25^{0}C, the value of Debye-Huckel constant is 0.509.

(A) 0.879 (B) -0.055 (C) - 0.003 (D) -0.905

68. The relation of free energy change with temperature and pressure is

(A) dG = VdP (B) dG = SdT (C) dG = VdP - SdT (D) dG = VdP + SdT

69. For a reversible reaction



Ist order in both the directions, the rate of reaction is given by:

(A) $K_1[A]$ (B) $-K_2[B]$ (C) $K_1[A]+ K_2[B]$ (D) $K_1[A]-K_2[B]$

70. The expression for Hamiltonian operator is

(A) $-\frac{h^2}{8m\pi^2}\nabla^2 + v$ (B) $\frac{h^2}{8m\pi^2}\nabla^2 + v$ (C) $-\frac{h^2}{8m\pi^2}\nabla^2 - v$ (D) $-\frac{h^2}{8m\pi^2}\nabla^2 - v^2$

71. The pH of a 0.005 molar aqueous solution of sulphuric acid is approximately

(A) 0.005 (B) 1 (C) 2 (D) 0.1

72. The rate constant, the activation energy and the Arrhenius parameter of a chemical reaction at 25°C are $3.0 \times 10^{-4}\ s^{-1}$, 104.4 KJ mol^{-1} and $6.0 \times 10^{14} s^{-1}$, respectively. The value of rate constant as $T \rightarrow \infty$ is;

(A) $6.0 \times 10^{14} s^{-1}$ (B) 3.6×10^{30} (C) Zero (D) infinite

73. Freundlich isotherms is not applicable at

(A) Low pressure (B) Room temperature
(C) High pressure (D) 273 K

74. What will be the equilibrium constant at 717 K for the reaction:

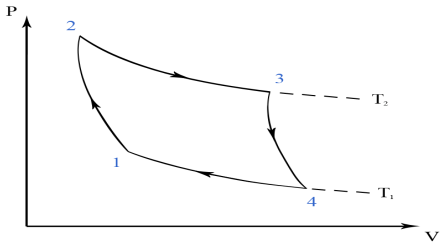
$$HI\ (g) \rightleftharpoons \frac{1}{2} H_2\ (g) + \frac{1}{2} I_2\ (g)$$

If its value for the reaction

$$H_2\ (g) + I_2\ (g) \rightleftharpoons 2HI\ (g)$$ **at 717 K is 64 ?**

(A) 64 (B) 8 (C) 1/64 (D) 1/8

75. The figure below describes a carnot engine work. Which path show adiabatic expansion.



(A) 3 to 4 (B) 2 to 3 (C) 1 to 2 (D) 4 to 1

x-x-x

MSc(HS/2Yr)(Zoology)

1. Which of the following amino acids has single codon
A) Isoleucine B) Tryptophan C) Valine D) Arginine

2. How many base pairs are there per helical turn in Z-DNA
A) 4 B) 8 C) 10 D) 12

3. DNA foot printing technique is usually used to identify
A) Sites of DNA where DNA binding proteins attach
B) Segment of DNA which code for a specific protein
C) Binding site of RNA polymerase to its promoter region
D) Site of termination of transcription process

4. In which of the following geological period did first bird appeared
A) Permian B) Triassic C) Jurassic D) Cretaceous

5. Michaelis constant is a measure of which one of the following
A) Concentration of enzyme B) Catalytic efficiency of enzyme
C) Thermostability of enzyme D) Affinity of enzyme for its substrate

6. In context of mutations in genetic material, which one of the following is an intercalating agent
A) Colchicine B) Ethidium bromide C) 5-bromouracil D) Rifampicin

7. Which one of the following vitamins has a role in collagen formation
A) Vitamin A B) Vitamin B2 C) Vitamin C D) Vitamin E

8. In Hydra gastrulation occurs by
A) Involution B) Divergence
C) Multipolar Ingression and delamination D) Epiboly

9. In the cell body of Paramecium, the elimination of undigested products takes place through the
A) Vestibule B) Cytostome C) Gullet D) Cytopyge

10. Skeleton secreting cell of the *Sycon* would include
A) Chondroblasts B) Fibroblasts C) Osteoblasts D) Scleroblasts

11. Neopallium appeared for the first time in one group of vertebrates and reaches at high level in another group of vertebrates. The two groups of vertebrates in question are respectively
A) Reptiles and birds B) Amphibians and mammals
C) Birds and mammals D) Reptiles and mammals

12. A competitive inhibitor

A) Increases Km of an enzyme
B) Decreases Km of an enzyme
C) Increases both Vmax and Km of the enzyme
D) Decreases Km but increases Vmax of the enzyme

13. RNA can sometimes be copied to DNA. This process is facilitated by

A) Ribozyme B) RNA polymerase
C) Reverse transcriptase D) RNA primase

14. Which one of the following sub process does not take place during protein synthesis in eukaryotes

A) Translocation of mRNA relative to ribosomes
B) Elongation
C) Methionine formylation
D) Termination

15. Which one of the following cells secrete testosterone

A) Spermatogonium B) Leydig cells
C) Sertoli cells D) Spermatocyte

16. Vasopressin plays a key role in

A) Osmoregulation B) Calcium absorption
C) Lipolysis D) Insulin release

17. Which of the following cell organelle shows acid phosphatase activity

A) Lysosomes B) Golgi complex
C) Rough endoplasmic reticulum D) Nucleolus

18. Taste buds are

A) Interoceptors B) Proprioceptors C) Mechanoreceptors D) Exteroceptors

19. Insertion or deletion of a single base in DNA strand is known as

A) Frameshift mutation B) Missense mutation
C) Nonsense mutation D) Suppressor mutation

20. Which one of the following echinoderms possess a respiratory tree

A) Sea cucumber B) Star fish C) Feather star D) Sea urchin

21. A deletion in short arm of chromosome 5 produces in human a genetic disorder called

A) Cri-du –Chat syndrome B) Down syndrome
C) Edward's syndrome D) Patau's syndrome

22. Three pallial areas namely ,Archipallium, Paleopallium and Neopallium are present in

A) Cyclostomes B) Amphibians C) Reptiles D) Fishes

23. Which cell organelle forms acrosome of the sperm

A) Mitochondria B) Golgi Complex C) Centriole D) Ribosome

24. Indeterminate cleavage occurs in

A) Nematodes B) Frog C) Annelids D) Molluscs

25. Ovulation in vertebrates is induced by

A) Testosterone B) LH C) LTH D) Oxytocin

26. Blastula in echinoderms and Amphioxus is

A) Coeloblstula B) Stereoblastula C) Amphiblastula D) Peribastula

27. Which of the following processes leads to the formation of polytene chromosomes

A) Non disjunction of chromatids during meiosis
B) Recombination between adjacent chromosome segments
C) Sister chromatid exchange
D) Repeated replication without separation of chromatids

28. Trichocysts occur in

A) Hydrozoa B) Porifera C) Protozoa D) Ctenophore

29. Choanocytes in asconoid sponge are present in

A) Incurrent canal B) Excurrent canal C) Atrium D) Radial canal

30. Which one of the following mollusks does not have either external or internal shell

A) Sepia B) Octopus C) Aplysia D) Doris

31. Which one of the following groups of Amino acids contain sulphur

A) Cysteine, methionine and cystine B) Arginine, citrulline and ornithine
C) Glycine, proline and serine D) Leucine, lysine and methionine

32. Ecdyosone , the moulting hormone in insects is liberated from

A) Corpora cardiac B) Prothoacic gland
C) Corpora allata D) X-organ

33. The fertilization cone that pulls the sperm into egg is formed from

A) Acrosome of sperm B) Acrosomal process
C) Vitelline layer of egg D) Plasma membrane of egg

34. Animals which can tolerate wide ranges of salt concentration are called Rest on bottom of water

A) Euryhaline B) Stenohaline C) Catadromous D) Anadromous

35. Centrum in 9^{th} vertebra of frog is

A) Procoelus B) Opisthocoelus C) Heterocoelus D) Acoelus

36. Which of the following enzymes is not proteinaceous in nature

A) Rennin B) Ribozyme C) Pepsin D) Trypsin

37. Cerebrospinal fluid is produced by

A) Neopallium B) Cerebellum C) Basal ganglion D) Choroid plexus

38. The function of allantois in birds is

A) Excretion and nutrition B) Excretion and protection of embryo

C) Respiration and nutrition D) Excretion and respiration

39. Allopatric speciation occurs when population shows

A) Reproductive isolation B) Ecological isolation

C) Seasonal isolation D) Geographic isolation

40. Which of the following is neither fish nor snake

A) Anguilla B) Typhlops C) Ophiosaurus D) Ichthyophis

41. Intervening sequences of a gene are called

A) Introns B) Exons C) Cistrons D) Codons

42. Hydrolytic enzymes in a eukaryotic cell are present in

A) Cytoplasmic matrix B) Mitochondria

C) Ribosomes D) Lysosomes

43. The earliest known jawless fossil vertebrates with heavy armour of dermal plates are collectively called as

A) Placoderms B) Ostracoderms C) Acanthocephalans D) Arthrospira

44. Which of the following metazoan phyla are grouped under radiata

A) Mollusca and echinodermata B) Arthropoda and porifera

C) Coelenterata and ctenophore D) Mollusca and coelenterata

45. Which of the following is a fresh water sponge

A) Spongilla B) Scypha C) Pheronema D) Oscarella

46. Glochidium and velliger are larval forms of

A) Sea urchin B) Nereis C) Asterias D) Bivalves

47. Germinal centres found in lymph node and spleen stimulates the secretion of

A) Support the development of immature B and T cells

B) Function in the removal of damaged erythrocytes from circulation

C) Act as the major source of stem cells and help to maintain hematopoiesis

D) Are sites of antigenic stimulation of mature B cells

48. Uropygial gland is present in

A) Frog B) Echidna C) Pigeon D) Snake

49. Tiedman's body in *Asterias* is concerned with

A) Reproduction B) Excretion
C) Production of amoebocytes D) Digestion

50. Thermoregulatory centre in mammals is located in

A) Pons varolli B) Floccular lobes
C) Hypothalamus D) Corpus callosum

51. In which one of the following stages of mitosis is the maximum chromosomal condensation observed

A) Cytokinesis B) Prophase C) Metaphase D) Anaphase

52. The first human hormone produced by rDNA technology was

A) Cortisol B) Glucagon C) Insulin D) Epinephrine

53. Heteromorphic nuclei occur in

A) Muscle cells B) Human germ cells
C) Neurons D) Ciliated protozoa

54. Zoological name of sea hare is

A) Aplysia B) Aphrodite C) Chaetopterus D) Doris

55. Which one of the following is free swimming larval stage of *Fasciola*

A) Sporocyst B) Redia C) Metacercaria D) Miracidium

56. Rotational cleavage occurs in

A) Insects B) Ascidians C) Mammals D) Amphibians

57. Mesoderm does not give rise to

A) Muscular system B) Nervous system
C) Circulatory system D) Gonads

58. Unio belongs to class

A) Scaphopoda B) Peleceypoda C) Amphineura D) Gastropoda

59. Aristotl's lantern is found in the class

A) Holothuroidea B) Echinoidea C) Ophiuroidea D) Crinoidea

60. Chewing and lapping type of mouth parts are found in

A) Butterflies and moths B) Honeybees and bumble bees
C) Grasshoppers and cockroaches D) Mosquitoes

61. Complete metamorphosis or holometabolous development following stages are present

A) Egg , nymph ,adult B) Egg ,naiads and adults
C) Egg and adult D) Egg, larva , pupa and adult

62. In which of the following sweat glands are absent

A) Spiny anteaters B) Cats
C) Rabbits D) Kangaroo

63. Which of the following is Opisthocoelus vertebra
A) 8^{th} vertebra of frog B) Vertebrae of fishes
C) All vertebrae of mammals D) Cervical vertebrae of some ungulates

64. In crocodiles stomach is divided into
A) Cardiac, fundus and pyloric regions B) Rumen ,reticulum and omasum
C) Proventriculus and ventriculus D) Rumen , omasum and abomasum

65. Which of the following is not a sensory cranial nerve
A) I B) VI C) VIII D) II

66. Which of the following is unpaired air sac of a bird
A) Interclavical B) Anterior thoracic C) Posterior thoracic D) Abdominal

67. Stomach is straight in
A) Turtle B) Rabbit C) Pigeon D) Salamander

68. Four aortic arches are present in adult
A) Petromyzon B) Mammals C) Urodeles D) Elasmobranchs

69. Hyostylic jaw suspension is found in
A) Amphibians B) Lung fishes C) Bony fishes D) Chimaeras

70. Mucus glands are absent in skin of
A) Fishes B) Amphibians C) Cyclostomes D) Mammals

71. All the following are characteristics of both Class I and class II MHC except
A) They are expressed codominantly
B) They are expressed constitutively on all nucleated cells
C) They are glycosylated polypeptides with tertiary domain structure
D) They present antigens to T-cells

72. Which of the following is not a crustacean larva
A) Nauplius B) Zoaea C) Phyllosoma D) Brachiolaria

73. Red data book are directories of endangered species compiled by
A) International Union for the Conservation of Nature (IUCN)
B) World Wild Life Fund (WWF)
C) National Museum of Natural History (NMNH)
D) United Nations Organization (UNO)

74. All the biological communities depend upon energy made available to it through the activity of

A) Decomposers B) Heterotrophs C) Autotrophs D) Microbes

75. Enzymes for the urea cycle are present in

A) Mitochondria of liver cells
B) Cytosol of liver cells
C) Lysosomes of liver cells
D) In both cytosol and mitochondria of liver cells

x-x-x

M.E. Electrical Engg. (Instrumentation & Control)

1. The magnitude of impedance (in ohm) of R-L-C series circuit under resonance is

   A) R B) 2 R C) $\sqrt{2}R$ D) LC

2. Pure capacitive circuit takes power from the ac line when

   A) Voltage and current are of same sign B) Voltage –ive and current +ive

   C) Voltage +ive and current -ive D) Power never flows in any part of a cycle

3. A coil with a certain number of turns has a specified time constant. If the number of turns is halved, its time constant would

   A) Remain same B) Becomes four-fold

   C) Becomes doubled D) Get halved

4. A load is connected to a source of 50V having 5Ω internal resistance. The maximum possible power supplied to the load is

   A) Zero B) 125W C) 250W D) 500W

5. In a two-wattmeter method of power measurement, one of the wattmeters shows zero reading, the power factor of load is

   A) Unity B) 0.5 C) Less than 0.5 D) Zero

6. If $v_1 = 10\sin(\omega t + 120^{\circ})$ and $v_2 = 20cos(\omega t + 120^{\circ})$ which of these statements is true?

   A) v_1 lags v_2 by 90°

   B) v_1 leads v_2 by 90°

   C) v_1 and v_2 are in phase

   D) Phase difference between $v_1$and v_2 can't be found without defining reference

7. A quantity that contains all the information in a given load is the

A) Apparent power B) Reactive power C) Average power D) Complex power

8. The ratio of power consumed in delta and star connected load having same impendence per phase for a three-phase given supply is

A) 3 B) 1/3 C) 1.732 D) 1

9. The value of function F(s) = 5s/ (s^2 + 5) at t = ∞ using final value theorem is

A) Zero B) One

C) Infinity D) Cannot be determined using final value theorem

10. If a unit step function (u(t)) is convolved with it, the result is:

A) $u^2(t)$ B) $t^2u(t)$ C) tu(t) D) δ(t)

11. When a periodic voltage $2 + 2cos\omega t$ is applied to a 2Ω resistor, the power dissipated in the resistor is

A) 2W B) 3W C) 5W D) 6W

12. When the port 1 of a two-port network is short-circuited, $I_1 = 8I_2$ and $V_2 = I_2$. Which of the following is true?

A) $y_{11} = 2$ B) $y_{12} = 8$ C) $y_{21} = 8$ D) $y_{22} = 2$

13. Which quantity in a magnetic circuit is analogous to electromotive force in an electric circuit?

A) Current B) Ampere-turns

C) Magnetic flux D) Magnetic flux density

14. The impulse response of a LTI system is a unit ramp function, the transfer function of the system is

A) $1/s^2$ B) 1/s C) 1 D) $2/ s^3$

15. Superposition theorem is applicable to

A) Linear network only B) Nonlinear network only

C) Both linear and nonlinear networks D) None of these

16. A transformer operates most efficiently at 2/3th of full-load. Its iron loss (Pi) and full load copper loss (Pc) are related as

A) Pi / Pc = 9/4 B) Pi / Pc = 3/2

C) Pi / Pc = 2/3 D) Pi / Pc = 4/9

17. In an induction motor the rotor field runs with respect to the stator

A) At synchronous speed in the same direction as the stator field

B) At the slip speed in the same direction as the stator field

C) At synchronous speed in the opposite direction as the stator field

D) At the slip speed in the opposite direction as the stator field

18. A dc series motor should not be run at light/no-load, because

A) It will draw a dangerously large current

B) It will run at a dangerously high speed

C) It will stall

D) It will run at very low speed

19. The power input to an induction motor is 50 kW when it is running at 4% slip. The stator losses are assumed negligible. Rotor copper loss is

A) 2kW B) 52kW C) 48kW D) 1kW

20. A synchronous motor is operating on no-load at unity power factor. If the field current is reduced

A) Both power factor and current will decrease

B) Power factor will decrease whereas current will increase

C) Both power factor and current will increase

D) Power factor will increase whereas current will decrease

21. When a thyristor is forward biased, the number of blocked PN junctions is

A) 1 B) 3 C) 2 D) 4

22. The di/dt rating of an SCR is specified for its

A) Decaying anode current B) Rising gate current

C) Decaying gate current D) Rising anode current.

23. In a single phase half wave circuit with RL load, and a freewheeling diode across the load, extinction angle β is more than π. For a firing angle α, the freewheeling diode and SCR would conduct, respectively, for

A) $\pi - \alpha, \beta$ B) $\pi - \alpha, \beta - \pi$ C) $\beta - \pi, \pi - \alpha$ D) $\beta - \alpha, \alpha$

24. Commutation overlap in the phase controlled ac to dc converter is due to

A) Load inductance B) Switching operation in the converter

C) Harmonic content of load current D) Source inductance

25. In a 3-phase full converter, the six SCRs are fired at an interval of

A) 30^0 B) 90^0 C) 60^0 D) 120^0

26. A single-phase full bridge inverter can operate in load-commutation mode in case load consists of

A) RL B) RLC over damped

C) RLC under damped D) RLC critically damped

27. A single-phase full-bridge VSI operating in square-wave mode supplies a purely inductive load. If the inverter time period is T, then the time duration for which each of the feedback diodes conduct in a cycle is

A) T B) T/4 C) T/2 D) T/8

28. As compared to power MOSFET, a BJT has

A) Lower switching losses but higher conduction losses

B) Higher switching losses but lower conduction losses

C) Higher switching and conduction losses

D) Lower switching and conduction losses

29. Improper biasing of a transistor circuit leads to

A) Distortion in the output signal

B) Faulty location of load line

C) Excessive heat production at collector terminals

D) Heavy loading of emitter terminal

30. A CRO screen has five divisions on the horizontal scale. If a voltage signal 10 sin (314 t + 60^0)V is applied with a time base setting of 20 ms/ div, the number of cycles of signal displayed on the screen will be

A) Two cycles B) 1.25 cycle C) 2.5 cycles D) five cycles

31. Two resistors of resistances 30±2 ohm and 60±3 ohm are connected in parallel. What will be absolute and relative error in equivalent resistance?

A) 11/9 ohm, 11/180 B) 9/11 ohm, 180/11

C) 9/11 ohm, 11/180 D) 13/11 ohm, 11/180

32. The power in a 3-phase four wire unbalanced circuit is to be measured. Minimum number of wattmeter(s) required is/are

A) 2 B) 1 C) 3 D) 4

33. The resolution of a $4\frac{1}{2}$ digit voltmeter is

A) 0.0001 B) 0.0020 C) 0.0010 D) 0.0002

34. In a wire wound strain gauge, the change in the resistance on the application of strain is mainly due to

A) Change in the length of wire B) Change in both length and diameter of wire

C) Change in diameter of wire D) Change in resistivity

35. A peizo-electric transducer has an output voltage of 3V at no load condition. It has a capacitance 250pico farad. It is connected to load capacitance of 125pico farad. What will be the voltage across load at high frequencies?

A) 1 V B) 2 V

C) 9 V D) cannot determined with the data given

36. A tachometer encoder has

A) One output B) Three outputs

C) Two outputs D) All of the above

37. An inverse transducer converts

A) Electric energy to any other form of energy

B) Mechanical displacement to electrical signal

C) Electric energy to light energy

D) Electrical energy to mechanical form

38. In a resistance potentiometer high value of resistance of potentiometer leads to

A) High value of sensitivity B) Low value of non-linearity

C) Low value of sensitivity D) Low value of error

39. A 10 bit A/D converter is used to digitise an analog signal in the 0 to 5 V range. The maximum peak to peak ripple voltage that can be allowed in the dc supply voltage is

A) Nearly 100 mV B) Nearly 5.0 mV

C) Nearly 25 mV D) Nearly 75 mV

40. CPU of an 8085 microprocessor consists of

A) ALU, accumulator, general and special purpose registers

B) Accumulator, timing and control unit

C) ALU, accumulator, timing and control circuits

D) ALU, accumulator, general and special purpose registers, timing and control circuits

41. The equivalent Boolean expression of A. (A+B) is

A) B B) AB C) A D) A+B

42. Transmission efficiency increases as

A) Both voltage and power factor increase

B) Voltage increases and power factor decreases

C) Voltage decreases power factor increases

D) Both voltage and power factor decrease

43. Consumers having low power factor equipment are advised to install

A) Tap changing transformer B) Inductors

C) Capacitor bank D) None of these

44. Relay used for protection of short transmission lines is

A) Reactance relay B) Impedance relay

C) Mho relay D) None of these

45. Bundled conductors are mainly used in high voltage overhead transmission line to

A) Reduce transmission line losses B) Reduce corona

C) Increase mechanical strength of the line D) Reduce sag

46. The rated voltage of a 3-phase power system is given as

A) rms phase voltage B) rms line to line voltage

C) peak line to line voltage D) peak phase voltage

47. Keeping in view the cost and overall effectiveness, the following circuit breaker is best suited for capacitor bank switching

A) Vacuum B) SF_6 C) Air blast D) Oil

48. If all the sequence voltages at the fault point in a power system are equal, then the fault is

A) Three-phase fault B) Line to line fault

C) Line to ground fault D) Double line to ground fault

49. For a given base voltage and base volt amperes, the per unit impedance value of an element is x. The per unit impedance value of this element when the voltage and volt amperes bases are both doubled will be

A) 0.5x B) 2x C) x D) 4x

50. In z-plane, the unit circle corresponds to

A) Imaginary axis of s-plane B) Negative real axis of s-plane

C) Positive real axis of s-plane D) Origin of the s-plane

51. In exponential series form, the state transition matrix is

A) e^{At} B) e^{-At} C) e^{-A} D) e^{A}

52. The characteristic polynomial $F(z) = 2z^4 + 7z^3 + 10z^2 + 4z + 1$ is

A) Stable B) Marginally stable

C) Unstable D) None of these

53. Zero of which compensator is located nearest to origin

A) Lead compensator only B) Both lead and lag compensator

C) Lag compensator only D) None of these

54. The steady-state error of a feedback control system with an acceleration input becomes finite in a

A) Type zero system B) Type two system

C) Type one system D) Type three system

55. Moving iron instruments can be used for the measurement of

A) Current only B) Voltage only

C) Both voltage and current D) Energy

56. For a feedback control system with a characteristics equation 1+K/s(s+1)(s+2)=0. The branches originating at s = 0 and s = -1, will break away on real axis as K increases on a point

A) -1.577 B) -0.423 C) -0.605 D) -0.005

57. Peak overshoot explicitly indicative of

A) Settling time B) Rise time

C) Natural frequency D) Damping ratio

58. The damping ratio of a system having characteristic equation s^2+2s+8=0

A) 0.353 B) 0.330 C) 0.500 D) 0.800

59. A 3-phase four wire star connected load takes line current of 2.5$\angle 60^0$A, 2.5$\angle$ -60^0A and 2.5A. The neutral current is

A) 5 A B) 0 A C) 10 A D) 15 A

60. The Laplace transform of $t\ cos\ (3\omega t)$ is

A) $(s^2+9)/(s^2-9)$ B)$(s^2-9)/(s^2+9)$
C) $(s^2-9)/(s^2+9)^2$ D) $(s^2+9)/(s^2-9)^2$

61. A system with transfer function $G(s)=\frac{(s^2+9)(s+2)}{(s+1)(s+3)(s+4)}$ is excited by $\sin(\omega t)$. The steady-state output of the system is zero at

A) ω = 1 rad/s B) ω = 2 rad/s C) ω = 3 rad/s D) ω = 4 rad/s

62. Starter in electric motor is used to

A) Limit high starting current B) Produce high starting torque

C) Increase the efficiency D) Control speed

63. The power factor of an induction motor at light load is

A) High B) Low C) Unity D) Zero

64. A three-phase slip ring induction motor develops a maximum torque of 120N-m for a rotor resistance of 4Ω, what will be the value of maximum toque if rotor resistance is halved.

A) 200 N-m B) 50 N-m C) 120 N-m D) 400 N-m

65. An ideal capacitor is charged to V_0 volts and connected at t = 0 across an ideal inductor L.

If $\omega_0 = \frac{1}{\sqrt{LC}}$, the voltage across the capacitor at time t > 0 is given by

A) V_0 B) $V_0 \cos(\omega_0 t)$

C) $V_0 \sin(\omega_0 t)$ D) $V_0 e^{-\omega_0 t} \cos(\omega_0 t)$

66. The signal flow graph is used for the determination of

A) Transfer function of a system B) Initial conditions of a system

C) Response of a system for a given input D) Both A) and C)

67. A 0-200 V voltmeter has an accuracy of 2 percent at full-scale reading. What will be the error (in %) if it reads 100 V?

A) 1 B) 2 C) 0.5 D) 4

68. The overexcited synchronous motor operates at

A) Leading power factor B) Lagging power

C) Unity power factor D) Zero power factor

69. The open loop transfer function of a unity –gain feedback control system is given by, $G(s) = \frac{10}{(s+3)(s+5)}$, the gain margin of the system in dB is given by

A) Zero B) One C) Five D) ∞

70. A system is defined by its impulse response $(n) = 2^n u(n-2)$. The system is

A) Stable and casual B) Casual but not stable

C) Stable but not casual D) Unstable and non-casual

71. The matrix A is given as A= [0 1 -1; -6 -11 6; -6 -11 5], the ratio of maximum eigen value to minimum eigen value is

A) 1.00 B) 0.50 C) 0.33 D) 3.00

72. A non ideal voltage source has a source impedance z_s with a resistive load, then at what value of load resistance the maximum power is transferred to load?

A) Load resistance is equal to source resistance

B) Load resistance is equal to complex conjugate of z_s

C) Load resistance is equal to magnitude of z_s

D) Load resistance is equal to source reactance

73. A step-up chopper supplying a load at 400V and operating at 250V. The off time of switch is 20μs and inductor current is continuous and ripple free. The frequency of chopper in kHz is

A) 31.25 B) 21.25 C) 0.031 D) 42.25

74. The bridge method commonly used for finding mutual inductance is

A) Heaviside Campbell bridge B) Schering bridge

C) De Sauty bridge D) Wien bridge

75. A 4-bit synchronous counter uses flip-flops with propagation delay times of 15 ns each. The maximum possible time required for change of state will be

A) 15 ns B) 30 ns C) 45 ns D) 60 ns

x-x-x

M.Tech.(Polymer)

1. For water when the pressure increases the viscosity
A) Also increases B) Decreases
C) Remains constant D) First decreases and then increases

2. The range value of critical Reynolds number for pipe flow is between
A) 2300-2900 B) 10000-10500
C) 100000-105000 D) 1000000-1050000

3. Discharge in laminar flow through a pipe varies
A) As the square of the radius B) Inversely as the pressure drop
C) Inversely as the viscosity D) As the square of the diameter

4. Pseudo plastic is a fluid for which
A) Dynamic viscosity decreases as the rate of shear increases
B) Newton's law of viscosity hold good
C) Dynamic viscosity increases as the rate of shear increases
D) Dynamic viscosity increases with the time for which shearing forces are applied

5. How does the head loss in turbulent flow in pipe vary?
A) Directly as velocity B) Inversely as square of velocity
C) Approximately as square of velocity D) Inversely as velocity

6. In continuous filtration (at a constant pressure drop), filtrate flow rate varies inversely as the
A) Filtration time only B) Square of the viscosity.
C) Washing time only D) Square root of the velocity.

7. Which of the following is not categorised as a "mechanical operation" ?
A) Agitation B) Filtration C) Size enlargement D) Humidification

8. Equivalent diameter of a particle is the diameter of the sphere having the same
A) Ratio of surface to volume as the actual volume
B) Ratio of volume to surface as the particle
C) Volume as the particle
D) Diameter of its hemisphere

9. Pick out the wrong statement.
A) Size enlargement (opposite of size reduction) is not a mechanical operation.
B) Wear and tear in wet crushing is more than that in dry crushing of materials.
C) Recycled coarse material to the grinder by a classifier is termed as circulating load.

D) A 'dust catcher' is simply an enlargement in a pipeline which permits the solids to settle down due to reduction in velocity of the dust laden gas.

10. Moore filter is a _____ filter.
A) Sand B) Press C) Rotary D) Leaf

11. Flapper nozzle is used in a/an _____ controller.
A) Digital B) Pneumatic C) Hydraulic D) Electronic

12. Which of the following is not the triple point of water ?
A) 273°K B) 32°F C) 492°R D) 32°R

13. The _____ of a vapor pressure thermometer is a functioning element.
A) None of these B) Pointer C) Bourdon tube D) Bulb

14. Which of the following is an undesirable dynamic characteristic of an instrument ?
A) Dead zone B) Time lag C) Reproducibility D) Static error

15. Reflectivity of a perfect black body is:
A) 0 B) 1 C) Infinity D) 10

16. Identify the correct statement
A) Pr number played the same role in forced convection as played by Gr number in free convection
B) Fourier's law applies to heat transfer by convection
C) Transmitivity of glass is zero
D) Rubber is not a polymer

17. Falling film evaporator can be used to concentrate
A) A heat sensitive material B) Orange juice
C) Both A and B D) Ceramic

18. Heat flux through a 50mm thick slab, if a temperature drop across the slab is 5 ^{0}C and its thermal conductivity is 0.1 Watts/m ^{0}C, is ……
A) 0.01W/m^2 B) 0.10W/m C) 10W/m^2 D) 100W/m^2

19. Pick out the wrong statement
A) Pressure drop in 2-4 heat exchanger is more compared with 1-2 heat exchanger
B) 2-4 heat exchanger stands for 2 shell and 4 tube passes
C) Baffles are used to induce turbulence in the heat transfer fluid
D) Boiling point of a given solute is non linear function of boiling point of the water at the same pressure

20. Thickness of thermal boundary layer
A) Increases with increase in thermal conductivity
B) Decreases with increase in thermal conductivity

C) Remains constant with increase in thermal conductivity
D) None of these

21. The units of heat transfer coefficient is
A) W/ m K B) W/m^2 K C) W/m^3 K D) $W/(m\ K)^2$

22. According to film theory, the average mass transfer coefficient (k_{ag}) related with the diffusivity(D) as
A) $k_{ag}\alpha$ D B) $k_{ag}\alpha\ D^{0.5}$ C) $k_{ag}\alpha\ D^{1.5}$ D) $k_{ag}\alpha\ D^2$

23. For a given separation which of the following is correct
A) Number of plates increases with increase in reflux ration
B) At total reflux, the reflux ratio is infinity
C) At minimum reflux ratio the number of plates are zero
D) At total reflux, the reflux ratio is zero

24. Diffusivity of gases varies as
A) $D \alpha T$ B) $D \alpha T0^{-5}$ C) $D \alpha T^{1.5}$ D) $D \alpha T^2$

25. No separation is possible for relative volatility (α)
A) $\alpha < 1$ B) $\alpha = 1$ C) $\alpha > 1$ D) $\alpha = 0$

26. Which of the following is the static characteristic of an instrument
A) Speed of response B) Fidelity C) Lag D) Accuracy

27. Gauge pressure is equal to
A) Absolute pressure +atmospheric pressure
B) Absolute pressure - atmospheric pressure
C) Atmospheric pressure - absolute pressure
D) Absolute pressure x atmospheric pressure

28. Resistances of most of the metals:
A) Decreases with temperature B) Increases with temperature
C) Remains constant with temperature D) None of these

29. Optical pyrometers are used to measure the temperature in the range of:
A) Less than $0\ ^0F$ B) Between 0 to $500\ ^0F$
C) Between 500 to $1000\ ^0F$ D) Between 1000 to $5000\ ^0F$

30. The moisture contained by a substance which exerts equilibrium vapor pressure less than that of the pure liquid at the same temperature is known as
A) Equilibrium moisture B) Bound moisture
C) Unbound moisture D) Free moisture

31. LMTD in case of counter current is
A) LMTD in case of parallel current B) = LMTD in case of parallel current

C) < LMTD in case of parallel current D) Infinity

32. High vacuum can be measured by using
A) Manometer B) Mcleod gage C) Bubbler system D) None of these

33. The unit of ……..is m^2/s
A) Kinematic viscosity B) Dynamic viscosity
C) Pressure D) None of these

34. Reynolds number can be defined as the ratio of
A) Viscous/inertial force B) Inertial/viscous force
C) Viscous/drag force D) Drag/viscous force

35. The ethanol-water mixture
A) Forms a minimum boiling azeotrops B) Forms a maximum boiling azeotropes
C) Shows negative deviation from ideality D) Can't be formed

36. In extractive distillation, solvent is
A) Of high viscosity
B) Present in overhead stream
C) Added to alter the relative volatility of the mixture
D) Not required

37. A flat plate of 4m length is kept parallel to air flowing at 5m/s at 15°C. Assuming the density of air to be $1.2kg/m^3$ and dynamic viscosity to be 1.76×10^{-5} kg/m-s and knowing that the flow becomes turbulent when Reynolds number exceeds 5×10^5, the flow will become turbulent at
A) 1.25m B) 1.47m C) 1.52m D) 1.74m

38. A hydrometer weighs 0.03N and has a stem at the upper end which is cylindrical and 3mm in diameter. It will float deeper in oil of specific gravity 0.75, than in alcohol of specific gravity 0.8 by how much amount?
A) 10.77mm B) 43.30mm C) 33.20mm D) 36.04mm

39. Tolerable limit of nitrogen oxides in air is _____ ppm.
A) 0.1 B) 5 C) 25 D) 1

40. Exposure to small amount of _____ results in high blood pressure & heart disease in human beings.
A) Asbestos B) Cadmium C) Mercury D) Hydrogen sulphide

41. Iron & manganese present as pollutant in water cannot be removed by
A) Oxidation followed by settling & filtration.
B) Lime soda process or manganese zeolite process.
C) Chlorination.
D) Ion exchange process.

42. Which of the following relationship is not correct is case of a chemical process plant ?
A) Total product cost = direct production cost + plant overhead cost.
B) Manufacturing cost = direct product cost + fixed charges + plant overhead costs
C) General expenses = administrative expenses + distribution & marketing expenses
D) Total product cost = manufacturing cost + general expenses

43. In a manufacturing industry, breakeven point occurs, when the
A) Total annual rate of production equals the assigned value.
B) Total annual product cost equals the total annual sales.
C) Annual sales equals the fixed cost.
D) Annual profit equals the expected value.

44. The total investment in a project is Rs. 10 lakhs and the annual profit is 1.5 lakhs. If the project life is 10 years, then the simple rate of return on investment is
A) 150% B) 15% C) 1.5% D) 10%

45. Nominal and effective interest rates are equal, when the interest is compounded
A) Semi-annually B) Quarterly
C) In no case, they are equal D) Annually

46. The impure iron (pig iron) that is tapped out from blast furnace contains about _____ percent carbon.
A) 4 B) 0.2 C) 8 D) 2

47. Sulphur melting pit in the sulphuric acid plant is made of
A) Lead lined stainless steel B) Cast iron
C) Hard wood D) Steel or cement-brick lined

48. Coke oven regenerators are made of _____ bricks.
A) Silica B) High electrical conductivity
C) Fire clay D) Low thermal conductivity

49. Residual magnetism in steel for magnets is increased by the addition of
A) Nickel B) Cobalt C) Chromium D) Tungsten

50. In an ideal gas mixture, fugacity of a species is equal to its
A) Partial pressure B) Chemical potential
C) Boiling point D) Vapor pressure

51. When a system is in equilibrium for all possible processes, the differential or finite change of entropy is
A) ? B) <0 C) >0 D) =0

52. Helmholtz free energy (A) is defined as
A) A = H – TS B) A = E – TS C) A = H + TS D) A = H x TS

53. One mole of nitrogen at 8 bar and 600 K is contained in a piston-cylinder arrangement. It is brought to 1 bar isothermally against a resisting pressure of 1 bar. The work done (in Joules) by the gas is

A) 30554 B) 10373 C) 4364.9 D) 4988.4

54. A solute distributes itself between two non-miscible solvents in contact with each other in such a way that, at a constant temperature, the ratio of its concentrations in two layers is constant, irrespective of its total amount". This is

A) The distribution law B) Followed from Margule's equation

C) A corollary of Henry's law D) None of these

55. The adiabatic throttling process of a perfect gas is one of constant enthalpy

A) In which there is a temperature drop

B) In which there is an increase in temperature

C) Which is exemplified by a non-steady flow expansion

D) Which can be performed in a pipe with a constriction

56. A gas performs the maximum work, when it expands

A) Non-uniformly B) Isobarically C) Isothermally D) Adiabatically

57. Pressure-enthalpy chart is useful in refrigeration. The change in internal energy of an ideal fluid used in ideal refrigeration cycle is

A) Zero B) Negative C) Positive D) Infinity

58. Molar heat capacity of water in equilibrium with ice at constant pressure is _____ Kcal/kg mole . °K

A) ∞ B) 15 C) 5 D) 10

59. In a solution containing 0.30 Kg mole of solute and 600 kg of solvent, the molality is

A) 1 B) 0.60 C) 0.50 D) 2

60. Mass transfer rate between two fluid phases does not necessarily depend on the _____ of the two phases.

A) Interfacial area B) Degree of turbulence

C) Physical properties D) Chemical properties

61. In batch distillation with constant reflux, overhead product composition _____ with time.

A) Does not vary

B) May increase on decrease, depends on the system

C) Decreases

D) Increases

62. Overall efficiency of the distillation column is

A) The ratio of number of ideal plates to actual plates

B) Always more than the point efficiency

C) The ratio of number of actual plates to ideal plates

D) Same as the Murphree efficiency

63. Nylon-6 is manufactured from
A) Caprolactum
B) Adipic acid and hexamethylene diamine
C) Sebasic acid and hexamethylene diamine
D) Maleic anhydride and hexamethylene diamine

64. The main use of butadiene is
A) In the manufacture of synthetic rubber
B) As a plasticiser for unsaturated polyester
C) Making brushes
D) As an anti-skimming agent in paint

65. In a cross linked polymer, the monomeric units are linked together to constitute a three dimensional network. Which of the following is a cross-linked polymer ?
A) Nylon-6 B) Polyester
C) Polythene D) Bakelite (phenol formaldehyde)

66. Tubeless tyres are made of _____ rubber, which is a co-polymer of isoprene & isobutylene.
A) Silicone B) Butyl C) Neoprene D) Nitrile

67. Thiokol is nothing but
A) Polysulphide rubber B) Polyamide fibre
C) Exponded polystyrene D) Engineering plastic

68. Steam reforming of naphtha is a source of hydrogen production for nitrogeneousfertiliser industry. What is the usual ratio of steam to carbon maintained in the process of steam reforming of naphtha ?
A) 1.5:1 B) 3.5:1 C) 10:1 D) 15:1

69. Hydrogen content of coke oven gas is _____ percent.
A) 84 B) 4 C) 58 D) 22

70. Pick out the wrong statement.
A) Calcium cynamide is used as weed killer in onion fields.
B) The phosphorous nutrient makes the plant stem stronger and increases its branches.
C) A straight fertilizer contains only one nutrient.
D) All the nitrogenous fertilizers are not soluble in water.

71. A universal testing machine is used to determine which of the properties of polymers:
A) Optical B) Chemical C) Mechanical D) Rheological

72. Maxwell and Voigt models explain the properties of polymers for:
A) Flow B) Degradation C) Mechanical strength D) Optical

73. A twin screw extruder mechanism is based on:

A) Co-rotation B) Counter rotation C) No rotation D) Both A & B

74. Corrosion in polymers is mainly evaluated by the following:

A) Discoloration B) Swelling C) Both A & B D) Iron oxide film

75. Izod and charpy tests for polymers is relevant to calculate the:

A) Impact resistance B) Compressive strength

C) Flexural strength D) Scratch resistance

x-x-x

MCA

1. Find the odd word from the following.
A) Swimming B) Sailing C) Diving D) Driving

2. Find the odd man out from the following.
A) 5720 B) 6715 C) 4278 D) 2640

3. If 'CAB' is coded as 'XZY', how 'DEAF' is coded?
A) WXVZ B) WXEV C) WVZU D) WZVU

4. John said to Mary, "The son of your only brother is the brother my wife." How Mary is related to John?
A) Mother B) Sister
C) Sister of father-in-law D) Maternal aunt

5. Bina is twice as old as Arun but twice younger than Fatima. Chitra is half the age of Arun but is twice older than Deva. Who is the second oldest?
A) Fatima B) Bina C) Chitra D) Deva

6. A man walks 1 km to East and then he turns to South and walks 5 km. Again he turns to East and walks 2 km. After this he turns to North and walks 9 km. Now, how far is he from his starting point?
A) 3 km B) 4 km C) 7 km D) 5 km

7. The number of times the hour hand and the minute hand of a clock are at right angle in a day are
A) 48 B) 24 C) 22 D) 44

8. **If** 26th January, 1996 was Friday, what day of the week was on 26th January, 1997?
A) Saturday B) Sunday C) Monday D) Thursday

9. **I**f after 10 years James's age will be 5 times his age 5 years back, What is his present age?
A) 6.2 years B) 7.7 years C) 8.7 years D) 10 years

10. In a row of children, Rohan is 7^{th} from left end and 14^{th} from right end. How many children are there in the row?

A) 18 B) 19 C) 20 D) 21

11. I enjoy _____ songs

A) to sing B) singing C) to singing D) sing

12. What is the synonym of PRAGMATIC?

A) Practical B) Curious C) Arrogant D) Theoretical

13. What is the synonym of SUCCINCT?

A) Next B) Peace C) Confuse D) Concise

14. What is the antonym of EMINENT?

A) Famous B) Imminent C) Unknown D) Happy

15. What is the antonym of ENIGMA?

A) Mystery B) Understood C) Angry D) Unhappy

16. Still waters run deep. The parts of speech of DEEP is

A) Adverb B) Adjective C) Proposition D) Conjunction

17. You will not succeed unless you work hard. The parts of speech of UNLESS is

A) Adverb B) Adjective C) Proposition D) Conjunction

18. Rajan is getting _____ the car.

A) From B) Out from C) Out of D) Outside

19. One must be careful when the luggage contains _____ items.

A) Virtuoso B) Fragile C) Voracious D) Vulnerable

20. Choose the word that is spelled wrongly.

A) Environment B) Successful C) Corridor D) Punctual

21. Making a mathematical model to copy the behavior of a real system is known as

A) Programming B) Hosting C) Modeling D) Simulation

22. In peer-to-peer networking, which of the following statements is true?

A) There is a server and many clients

B) There is a client and many servers

C) Every computer in the network can be a client, server or both at the same time

D) Every computer in the network can be a server

23. The full form of URL is

A) Universal Resource Locator B) Uniform Resource Locator

C) Universal Resource Location D) Uniform Resource Location

24. Several programs are in memory in the state of execution and whenever a program waits for input-output operation to complete, another program is executed by CPU. This is known as

A) Multiprocessing B) Multiprogramming

C) Timesharing D) Multitasking

25. The Binary equivalent of the decimal number 25.4375 is

A) 00011001.0111 B) 00011010.1011

C) 00110011.1100 D) 11100010.1010

26. _____standard is used to encode, represent and handle text in many local and international languages?

A) ASCII B) BCD C) Hexadecimal D) UNICODE

27. The decimal equivalent of the Hexadecimal number 3A.BC3 is

A) 58.718 B) 48.635 C) 58.735 D) 68.688

28. Which operation is performed by the following C program segment (p and q are integers)?

```
p = q + p;
q = p – q;
p = p – q;
```

A) Doubles the contents of p B) Doubles the contents of q

C) Doubles the contents of p and q D) swaps the contents of p and q

29. The following C program segment results in what?

```
for (i = 3; i < 15; i+ = 3);
 printf("%d", i);
```

A) Printing of 15 B) A syntax error C) Printing of 12 D) An execution error

30. Who among the following devised a test to know whether a computer system has achieved Intelligence or not?

A) John McCarthy B) Charles Babbage C) Alan Turing D) Ada Lovelace

31. One Exabyte is approximately equal to how many Bytes?

A) 10^{15} B)10^{18} C) 10^{21} D) 10^{24}

32. Consider the operation of addition. For two numbers the operation would generate a sum. If the operands are strings, the same operation would produce a third string by concatenation. This feature is known as

A) Encapsulation B) Polymorphism C) Inheritance D) Dynamic binding

33. What will be the output of the following C language statement?
printf ("%c", 100);

A) 100 B) Garbage

C) Hexadecimal value of 100 D) ASCII value of 100

34. Worst case complexity of quick sort algorithm to sort n numbers is

A) n*log n B) n C) n*n D) log n

35. The command 'mv' in Unix is used for

A) Removing a file B) Renaming a file

C) Copying a file to other D) Deleting a file

36. If $f(x) = |x| + x^2$, then $f^1(-1) = ?$

A) -3 B) -1 C) 1 D) 3

37. The differentiation of sin*x* with respect to cos*x* is ?

A) tan*x* B) -tan*x* C) cot*x* D) -cot*x*

38. $\int \ln e^{2x}\, dx$ = ?

A) $x + c$ B) $x^2 + c$ C) $\ln x + c$ D) $e^x + c$

39. Suppose three dice are thrown. What is the probability to get equal number on the face of each one?

A) 1/6 B) 1/3 C) 1/36 D) 1/12

40. What is the value of v if A = $\begin{bmatrix} 3 & 4 \\ 6 & v \end{bmatrix}$ is a singular matrix?

A) 5 B) 6 C) 8 D) 7

41. If A= {1,2,3} and B= {4, 5}, which of the following is not a function from A to B?

A) { (1, 4), (2,5) , (3, 4)} B) { (1, 4), (2,4) , (3, 4)}

C) { (2, 4), (3,5) , (1, 4)} D) { (1, 4), (1,5) , (2, 4) (2, 5), (3,4) , (3, 5)}

42. $i^{100} + i^{101} + i^{102} + i^{103}$ =?

A) 0 B) 1 C) I D) -i

43. If the remainder obtained by dividing $f(x) = kx^3 - 4x^2 - 3x + 5$ by x+1 is 3, the value of k is

A) 1 B) -1 C) 2 D) -2

44. What is the quotient obtained after dividing $x^3 - 6x^2 + 11x - 6$ by $x^2 - 5x + 6$?

A) x+1 B) x-1 C) x+2 D) x-2

45. $\sin(x - \pi/2)$ = ?

A) sin x B) cos x C) -sin x D) -cos x

46. $\cos(\sin^{-1} \sqrt{(3/2)})$ =

A) 0 B) 1 C) 1/2 D) √3

47. If $\log(x+2) - \log(x-1) = \log(2)$, the value of x =

A) 2 B) 4 C) 3 D) 5

48. If $9 + e^{(2x-4)} = 10$, the value of x =

A) 2 B) 3 C) 4 D) 5

49. What is the 11^{th} term of the sequence m - 2n, m - n, m,…?

A) m + n B) m + 6n C) m - n D) m + 8n

50. The sum of the series $\sum_{k=1}^{15} k^2$ is

A) 1200 B) 875 C) 1240 D) 1345

51. Which of the following cannot be used for graphical representation of statistical data?

A) Bar chart B) Histogram C) Frequency polygon D) Flow chart

52. If sum of the roots of a quadratic equation is 5 and the product of the roots is 6, then the quadratic equation is

A) $x^2 - 5x + 6 = 0$ B) $x^2 - 5x - 6 = 0$ C) $x^2 + 5x - 6 = 0$ D) $x^2 + 5x + 6 = 0$

53. The highest common factor of the polynomials: $20x^2 - 9x + 1$ and $5x^2 - 6x + 1$ is

A) 5x+1 B) 5x -1 C) 4x-1 D) 4x+1

54. If e is the edge of a cube, the total surface area of the cube is

A) e^2 B) $3e^2$ C) $6e^2$ D) $8e^2$

55. Which of the following is not a convex region?

A) $\{ (x,y): x^2 + y^2 \leq 1 \}$ B) $\{ (x,y): x^2 + y^2 \geq 1 \}$

C) $\{ (x,y): 4x^2 + 9y^2 = 36 \}$ D) $\{ (x,y): y \geq 1 \text{ and } y \leq 4 \}$

56. The harmonic mean of the numbers 1, 4, and 4 is

A) 2 B) 3 C) 2.5 D) 1.5

57. If the coefficients of x^7 and x^8 in the expansion of $(2+x/3)^n$ are equal, then n =

A) 56 B) 55 C) 45 D) 15

58. The equation of the line joining the points (1, 3) and (-2, 5) is
A) 3x +2y +23 =0 B) 5x-4y+9 = 0 C) 2x+3y-11=0 D) 2x -3y +11 =0

59. The points (0,0), (3,4), (7,4) and (4, 0) form a
A) Rhombus B) Square C) Parallelogram D) Rectangle

60. What is the angle between the vectors 3i+2j-5k and 5i-3j-2k?
A) 30^o B) 60^o C) 45^o D) 90^o

61. The standard deviation is the best measure of _____
A) Correlation B) Frequency C) Regression D) Dispersion

62. If the mean of a data is 22.5 and the median value is 20, what is the value of mode?
A) 20 B) 30 C) 15 D) 18

63. The number of different permutations of the word 'BANANA' is
A) 60 B) 720 C) 180 D) 120

64. The number of diagonals that can be drawn by joining the vertices of an octagon are
A) 30 B) 30 C) 48 D) 20

65. If A and B are two sets such that A U B has 18 elements. If A has 8 elements and B has 15 elements, then the number of elements of A ∩ B will be
A) 7 B) 5 C) 4 D) 8

66. Lim $(x - \sin x) / x^3$ is
$x \to 0$

A) 1/2 B) 1 C) 1/6 D) 2

67. lim $(1^2+2^2+3^2+.....+n^{2)} / n^3 =$
$n \to \infty$

A) 1 B) 0 C) 1/2 D) 1/3

68. The derivative of $\sin^2 x$ with respect to x is

A) Sin x B) sin 2x C) cos 2x D) cos x

69. If the absolute value of $X < 1$, the sum of the infinite series $1 + X + X^2 + X^3 + X^4 + \ldots$ is

A) 1 B) 1+X C) 1/ (1-X) D) 1/ (1+X)

70. The distance of the point P(x, y, z) from the x-axis is

A) $\sqrt{(y^2 + z^2)}$ B) $\sqrt{(z^2 + x^2)}$ C) $\sqrt{(x^2 + y^2)}$ D) $\sqrt{(x^2 + y^2 + z^2)}$

71. There are 10 lamps in a hall and each one of them can be switched on independently. The number of ways in which the hall can be illuminated is

A) 2020 B) 1010 C) 1023 D) 23456

72. If $\cos\alpha$, $\cos\beta$, $\cos\gamma$ are direction cosines of a line, then the value of $\sin^2\alpha + \sin^2\beta + \sin^2\gamma$ =

A) 1 B) 0 C) 3 D) 2

73. The relation y = A Sinx + B cos x, where A and B are any constants can be represented by the differential equation

A) $dy/dx = y$ B) $d^2y/dx^2 + y = 0$ C) $d^2y/dx^2 = y$ D) $dy/dx = -y$

74. The number relations on set A containing n elements is

A) 2 to the power of n B) n^2

C) 2 to the power of n^2 D) 2 to the power of 2n

75. The area of the region bounded by the curve $y=2x-x^2$ and the line y=x is

A) 1/3 B) 1/2 C) 1/4 D) 1/6

x-x-x

MSc(2Yr)(Microbial Biotechnology)

1. Which of the following microbes does not contain mycolic acid in its cell wall?
A) *Mycobacterium tuberculosis*
B) *Staphylococcus aureus*
C) *Nocardia asteroides*
D) *Mycobacterium leprae*

2. Which of the following bacteria produces endospores and is a strict aerobe?
A) *Corynebacterium diphtheriae*
B) *Listeria monocytogenes*
C) *Bacillus anthracis*
D) *Clostridium perfringens*

3. Tyndallization is a process used for destruction of
A) Spores
B) Acid fast bacteria
C) Pathogenic bacteria
D) Fungal contaminants

4. Chronic granulomatous disease arises due to defects in the
A) Monocytes and neutrophils
B) T cells
C) B cells
D) RBCs

5. Which of the following scientists is best known for his work on antiseptic surgery?
A) Joseph Lister
B) Robert Koch
C) Sergei Winogradsky
D) Alphonse Laveran

6. The antifungal drug griseofulvin targets
A) Cell wall
B) 60 S ribosome
C) DNA gyrase
D) Microtubule assembly

7. Formation of a pseudomembrane in the throat is a diagnostic feature of
A) Diphtheria
B) Scarlet fever
C) Influenza

D) Tuberculosis

8. Lithotrophs are bacteria that use inorganic molecules as a source of
A) Carbon
B) Electrons
C) Energy
D) Water

9. If pH of a solution is 2, what is its pOH?
A) 5
B) 2
C) 12
D) 6

10. Growth yields are proportional to the concentration of most limiting nutrients. This is popularly known as
A) Liebig's law
B) Shelford's law
C) Schaechter's law
D) Kleiber's law

11. Which of the following groups of microbes will be most resistant to moist heat killing, assuming that all are mesophiles?
A) Gram-positive bacteria
B) Gram-negative bacteria
C) Yeasts
D) Moulds

12. Arrange the following in increasing order of their reducing potential:
(i) $FAD/FADH_2$, (ii) fumarate/succinate, (iii) NAD+/NADH, (iv) $CoQ/CoQH_2$
A) iii, i, ii, iv
B) i, iii, ii, iv
C) iv, iii, i, ii
D) iv, i, ii, iii

13. In eukaryotic microbes, fatty acid oxidation and synthesis take place in _____ and _____ respectively.
A) Cytoplasm and lysosomes
B) Mitochondria and cytoplasm
C) Cytoplasm and mitochondria
D) Both take place in cytoplasm

14. The common reaction centre chlorophyll in purple bacteria is
A) P680

B) P700
C) P870
D) P840

15. When a mutation results in a triplet coding for different but functionally equivalent amino acid, it is called
A) Neutral mutation
B) Silent mutation
C) Transition
D) Transversion

16. During Hfr recombination, the recipient becomes
A) F+
B) F-
C) Hfr +
D) Either F+ or Hfr+

17. Bacterial artificial chromosomes are cloning vectors commonly based on
A) Cosmid
B) Phagemid
C) F factor
D) Bacterial genome

18. Mitochondria in eukaryotes may have arisen from an ancestor of
A) *Rickettsia*
B) *Treponema*
C) *Chlamydia*
D) Cyanobacteria

19. *Sargassum* is an example of
A) Red algae
B) Brown algae
C) Dinoflagellates
D) Euglenoids

20. Secondary steps in waste water treatment involve the removal of _____ by _____ processes respectively
A) Organic matter, physical
B) Organic matter, biological
C) Inorganic matter, physical
D) Inorganic matter, biological

21. Which of the following antibody classes possesses a J chain?
A) IgA B) IgD C) IgE D) IgG

22. In addition to absorbing the red light, chlorophyll molecules may also absorb light in the _____range
A) Yellow
B) Green
C) Blue
D) Pink

23. Somatic hyper mutation is important in the development of the following type of immune cells.
A) T cells
B) Macrophages
C) Neutrophils
D) B cells

24. Amongst the eukaryotic RNA polymerases, RNA polymerase I is localized in the
A) Nucleolus
B) Chromatin
C) Nuclear matrix
D) Cytoplasm

25. Salivary glands are primarily infected during which of the following viral infections?
A) Measles
B) Influenza
C) Herpes
D) Mumps

26. Granuloma formation is often associated with the following bacterial disease
A) Sore throat
B) Tuberculosis
C) Gastroenteritis
D) Pertussis

27. Which of the following is a common post-replication repair system?
A) Excision repair
B) Recombination repair
C) SOS repair
D) Mismatch repair

28. Pectinolysis will be more common in
A) Butter
B) Meats
C) Starchy foods
D) Fruits

29. Mycotoxins of the group fumonisins act by inhibiting
A) Sphingolipids
B) Proteins

C) DNA
D) RNA

30. Butter milk and yogurt are produced through which types of lactic acid fermentation?
A) Both mesophilic
B) Both thermophilic
C) Mesophilic and thermophilic respectively
D) Thermophilic and mesophilic respectively

31. Rope spoilage of bread is commonly due to
A) *Rhizopus*
B) *Aspergillus*
C) *Bacillus*
D) *Leuconostoc*

32. Which of the following is a promising source of Vitamin A?
A) *Penicillium*
B) *Rhodotorula*
C) *Streptococcus*
D) *Rhizopus*

33. Which of the following is the smallest of all amino acids?
A) Glycine
B) Histidine
C) Proline
D) Alanine

34. A culture system is which particular nutrients are regularly added to the culture system without removal of spent media is called _____ culture
A) Chemostat
B) Continuous
C) Batch
D) Fed-batch

35. Which of the following is a neurotoxin?
A) Tetanus toxin
B) Shiga toxin
C) Exotoxin A
D) Cholera toxin

36. One gene one enzyme hypothesis was proposed by
A) Beadle and Tatum
B) Meselson and Stahl
C) Hershey and Chase
D) Griffith

37. In recent months, illegal use of which of the following GM crops has been reported in India?

A) Bt cotton
B) Bt brinjal
C) Flavr savr tomatoes
D) GM maize

38. Wobble hypothesis is linked with
A) Degeneracy of the DNA code
B) Post-translational protein processing
C) Semi-conservative DNA replication
D) Protein folding

39. Which of the following statements about membrane proteins is not correct?
A) Integral membrane proteins have transmembrane domains rich in hydrophobic amino acids.
B) Integral membrane proteins have ends rich in hydrophilic amino acids.
C) Transmembrane porins have hydrophilic amino acids that point inwards in the β-barrels
D) Integral membrane proteins are anchored to the lipid bilayer by ionic bonds.

40. Ras protein is a
A) Tyrosine kinase
B) Serine-threonine kinase
C) GTPase
D) Phosphatidylinositol kinase

41. Which of the following methods is commonly used to introduce genes into plant cells?
A) Microinjection
B) Electroporation
C) Transformation of competent cells
D) Gene gun

42. p53 normally promotes
A) Apoptosis
B) DNA replication
C) Cell division
D) RNA synthesis

43. Which would be the best chromatography technique to separate a protein that binds strongly to its substrate?
A) Cation exchange chromatography
B) Affinity chromatography
C) Gel filtration
D) Anion exchange chromatography

44. In two-dimensional gel electrophoresis system, the second step involves separation of proteins based on their
A) Molecular weight
B) Charge to mass ratio
C) Isoelectric point
D) Protein-specific antibodies

45. In PCR, the advantage of Pfu over Taq polymerase is
A) High efficiency

B) Thermostability
C) Cheaper synthesis
D) Lower error rate

46. If an mRNA is 312 nucleotide in length, including start and stop codon, it will transcribe a protein about _____ amino acids in length
A) 110 B) 106 C) 103 D) 120

47. Which of the following is the most abundant protein in nature?
A) Rubisco
B) Chlorophyll
C) Insulin
D) Myoglobin

48. Allosteric regulation acts by
A) Reversible binding through formation of non-covalent bond
B) Reversible binding through formation of covalent bond
C) Irreversible binding through formation of covalent bond
D) Irreversible binding through formation of non-covalent bond

49. Which of the following determine the overall shape of a bacterial cell?
A) Cell membrane
B) Nuceloid
C) Cell wall
D) Cytoskeleton

50. Which of the following eukaryotic cell wall components are nitrogenous compounds?
A) Glucans
B) Cellulose
C) Lignin
D) Chitin

51. Which of the following are mineralized biological structures?
A) Glycosaminoglycans
B) Chitin
C) Pectins
D) Diatom cell walls

52. Which of the following is not a technique for tissue homogenization?
A) Bead beating
B) Dehydration
C) Sonication
D) Grinding

53. In an ecosystem, biomass will be minimal at which of the following trophic levels?
A) Carnivores
B) Herbivores
C) Primary producers
D) Both B and C

54. Northern blotting detects
A) DNA

B) RNA
C) Proteins
D) Lipids

55. Trickling filters are used for
A) Wine production
B) Waste water treatment
C) Acetic acid synthesis
D) Manufacturing of drugs

56. Prions are infectious particles containing only the
A) Proteins
B) DNA
C) RNA
D) Lipids

57. Guanosine is a
A) Purine
B) Pyrimidine
C) Nucleotide
D) Nucleoside

58. Which of the following structural forms of DNA is a left-handed helix?
A) Z form
B) A form
C) B form
D) X form

59. Cybrids are plant hybrids produced by fusion of
A) Two cytoplasts
B) Protoplast and nucleus
C) Protoplast and cytoplast
D) Two protoplasts

60. The antibiotic that inhibits protein synthesis
A) Ciprofloxacin
B) Polymyxin
C) Amikacin
D) Rifampicin

61. The housekeeping sigma factor for *E. coli* is
A) Sigma 54
B) Sigma 70
C) Sigma 38
D) Sigma 24

62. Thick filaments in skeletal muscles are composed of
A) Tropomyosin
B) Actin
C) Troponin
D) Myosin

63. Cell-mediated adaptive immunity involves
A) B cells
B) T cells
C) Macrophages
D) Neutrophils

64. The points at which crossing-over takes has taken place between homologous chromosomes are named
A) Synaptonemal complexes
B) Centromeres
C) Chiasmata
D) Interkinins

65. An interaction between non-allelic genes in which one locus prevents expression of an allele at another locus, but not vice versa is called
A) Epistasis
B) Complementation
C) Collaboration
D) Modification

66. The gliding bacteria that aggregate to form spore-releasing fruiting bodies under harsh conditions are
A) Actinomycetes
B) Myxobacteria
C) *Rickettsia*
D) *Chlamydia*

67. Serum sickness is an example of _____ hypersensitivity.
A) Type I B) Type II C) Type III D) Type IV

68. The famous quote "In the field of observation, chance favors only prepared minds." was given by
A) Charles Darwin
B) Robert Hooke
C) Louis Pasteur
D) Robert Koch

69. Gray ring is used in which of the following microscopes?
A) Phase contrast microscope
B) Scanning electron microscope
C) Transmission electron microscope
D) Confocal microscope

70. Production of secondary metabolites is associated with _____ phase of bacterial growth curve
A) Lag B) Log C) Stationary D) Death

71. Which of the following is not a plasmid vector?
A) pBR322
B) pUC19
C) pACYC177
D) M13

72. In commensalism,
A) Both participants are benefitted
B) One is benefitted, other remains unaffected
C) One is benefitted, other is harmed
D) Growth of one participant is completely dependent on the other

73. Under conditions of antigen excess, the complexes between IgA and a tetravalent antigen will have the composition
A) Ag2Ab1
B) Ag4Ab1
C) Ag4Ab3
D) Ag2Ab7

74. Which of the following organisms is an obligate intracellular parasite?
A) *Rickettsia prowazekii*
B) *Myocobacterium tuberculosis*
C) *Salmonella typhi*
D) *Shigella flexneri*

75. Kojic acid is a major secondary metabolite in
A) *Penicillium*
B) *Aspergillus*
C) *Micrococcus*
D) *Leuconostoc*

x-x-x

Masters in Public Health

1. Which of the following is true of nuts in our diet?
A) Fat content is 20 %
B) Protein content is 40 %
C) Good source of Vitamin B
D) Poor source of iron

2. Which of the following has the highest lactose per unit quantity (100 ml)?
A) Cow's milk B) Buffalo's milk C) Goat's milk D) Human milk

3. Which of the following disease is transmitted from animals to man?
A) Rickets B) Filaria C) Plague D) Syphilis

4. Which of the following is the best measure of protection against occupational deafness?
A) Reduction of working hours
B) Reduction of the noise at source
C) Wearing of ear muffs/plugs
D) Early diagnosis of deafness

5. Who initiated '*Sulabh Shauchalaya'* movement in India?
A) Akshay Kumar
B) Rajinder Singh
C) Sundarlal Bahuguna
D) Bindeshwar Pathak

6. Which of the following is the commonest cancer of women in India?
A) Breast B) Mouth C) Cervix D) Lungs

7. What is the minimum age at marriage in India?
A) Boys 21 years ; Girls 21 years
B) Boys 21 years ; Girls 18 years
C) Boys 18 years ; Girls 18 years
D) Boys 18 years ; Girls 15 years

8. Kala azar is transmitted by –
A) Tse Tse fly B) Sand fly C) Black fly D) House fly

9. Which of the following is TRUE about 'customs' ?
A) These disappear in highly developed societies
B) These inspire development of laws
C) These are only observed in less vital areas of human conduct
D) These are NOT linked with conventions

10. Which of the following diseases has rashes with fever?
A) Cholera B) Food poisoning C) Measles D) Epilepsy

11. Which of the following is one of the mode of transmission of Hook Worm?
A) Through insect bite
B) Through blood
C) Through soil
D) Through food

12. Which of the following is true about 'acculturation'?

A) It means cultural contact
B) It CAN NOT happen through trade
C) It is bad for civlization
D) Radio & TV retard acculturation

13. Which of the following is TRUE about 'IQ level ranges' for mental retardation?
A) Imbecile IQ = 0 – 24
B) Moron IQ = 50 - 69
C) Normal IQ = 80 – 89
D) Near genius IQ = 110 and over

14. As per the Directive Principles of State Policy of Constitution of India, the State shall direct its policy to secure which of the following?
A) Right to work
B) Job satisfaction of children
C) Protection of women against sexual exploitation
D) Maternity benefit to abused women

15. Stage of contraction of a family begins with which of the following ?
A) Marriage of the first child
B) Birth of the last child
C) First child leaves home
D) Death of the first child

16. Which of the following vitamin helps in absorption of iron in our body?
A) Vitamin A B) Vitamin B C) Vitamin C D) Vitamin D

17. Which of the following disease is NOT transmitted through respiratory route–
A) Diphtheria B) Cholera C) Rubella D) Chicken pox

18. Which of the following is a criteria of a sanitary kitchen–
A) Walls should be less than 6 feet high
B) Perishable and non- perishable food items to be kept together
C) Waste to be disposed off on alternate days
D) Doors should be of self-closing type

19. Which of the following is a criteria of a sanitary slaughter house?
A) It should be conveniently located near residential areas
B) Blood & offal etc should be discharged in public sewers
C) Water supply should be intermittent
D) Meat should be stored at a temperature below 5 degree C

20. Which of the following is a part of a healthy diet of a person?
A) Salt intake should be 5 -10 gms per day
B) Dietary fat should be 30 – 45 % of total dietary intake
C) Proteins should be 10 – 15 % of total dietary intake
D) Junk food should be used in moderation

21. Which of the following is TRUE about oils?
A) Refining of vegetable oils is done with steam
B) Refining of vegetable oils removes unsaurated fatty acids
C) Complete dependence on one vegetable oil is a healthy option

D) For frying,vegetable oils with lower thermal stability should be used

22. As per Indian philosophy, *Vanaprastha ashrama* of life mainly deals with ?
A) Renunciation; salvation
B) Retirement; retreat from worldly life
C) Vegetarianism; dietary austerity
D) Study of scriptures; obligations to family

23. Child Labor Act DOES NOT apply to _____.
A) Cloth printing or wool cleaning B) Cashew descalding & Processing
C) Recognized school based activities D) Children aged 12 -14 years

24. Which among the following challenges India needs to overcome to harness the opportunities created by demographic dividend?
A) Serious problems with higher education
B) Surplus of high-quality faculty
C) Excessive incentive structures
D) More jobs outsourced from the developed countries

25. Which of the following description is TRUE about 'Globalization'?
A) It refers to detachment of national economies from the international economy
B) It implies the diminution or elimination of state-enforced restrictions on exchanges across borders
C) It is a constellation of processes by which nations, businesses and people are becoming more independent
D) It has reduced poverty and unemployment

26. In India, peak incidence of typhoid is in _____?
A) Jan. – March B) April – June
C) July – September D) October - December

27. Cancer of which of the following organ /body part is more prevalent in developing countries as compared to developed countries?
A) Stomach B) Oral cavity C) Breast D) Lung

28. Which of the following is included in MINIMUM NEEDS PROGRAMME of India?
A) Two child norm B) Food safety
C) Houses for landless laborers C) Hospital deliveries

29. Rabies does not exist in
A) USA B) Russia C) Africa D) Australia

30. Beyond which of the following period of pregnancy,law in India generally DOES NOT allow abortion under MTP Act?
A) 8 weeks B) 12 weeks C) 16 weeks D) 20 weeks

31. During which of the following period a female is least likely to get pregnant ?

A) During menstruation B) 12 days after menstruation
C) 14 days before menstruation D) 16 days before menstruation

32. As compared to rivers the water obtained from deep wells ___

A) Requires less purification
B) Is less likely to be free from harmful bacteria
C) Is lesser in mineral content
D) Has more chances of contamination

33. Which of the following disease has been eradicated from the world?

A) Chicken pox B) Plague C) Small pox D) Rabies

34. Which of the following disease DOES NOT have a vaccine for its control?

A) Scabies B) Plague C) Typhoid D) Yellow fever

35. Which of the following 4 alternatives is the most appropriate description about the 3 words – Vesuvius: Etna : Kilimanjaro?

A) These are sites of volcanoes B) These are hills of Italy.
C) These are island countries D) These lie in polar region

36. Which of the following 4 alternatives is the most appropriate description about the 3 words – Barauni: Digboi : Ankleshwar?

A) These are famous for oil fields
B) These are famous religious places
C) These are famous tourist places of South India
D) These are famous for handlooms

37. Which of the following statements is FALSE about the impact of globalization on health and health promotion?

A) It has retarded spread of infectious diseases across the globe
B) It facilitates widespread adoption of unhealthy "Western" lifestyle
C) It can influence our norms and values about social equity
D) It promotes social dislocation and political instability

38. Which of the following 4 alternatives is the most appropriate description about the 3 words – Viper: Krait: Mamba?

A) These are boot polishes B) These are haunting spirits
C) These are snakes D) These are containers

39. Which among the following is NOT a good example of the political commitment of a government to the nation's health?

A) Declaration of health and health care as constitutional rights of citizens
B) Formulation of occupational health and safety legislations
C) Adoption of rehabilitation model of health and health care services as the mainstay of health promotion
D) Enforcing laws against the production and sale of asbestos

40. Which of the following 4 alternatives is the most appropriate description about the 3 words – Spinach: Fenugreek: celery?

A) These are cactus plants
B) These are wild flowers
C) These are wild plants
D) These are leafy vegetables

41. Which of the following 4 alternatives is the most appropriate description about the 3 words – Aphids: Weevils: Locusts?

A) These are plant pests
B) These damage the wood
C) These live inside the host
D) These cause disease in cattle

42. Which of the following statement reflects the fatalistic attitude of people of India about the disease etiology?

A) 'This disease is always fatal'
B) 'This disease is a result of my past sins'
C) 'This disease spreads very fast'
D) 'This disease has very costly cure options'

43. Which of the following 4 alternatives is the most appropriate description about the 3 words – Slumber: Drowze: Snooze?

A) These are share market terms
B) These are terms connected with sleep
C) These are terms connected with global peace
D) These are first symptoms of sleep walking disease

44. Which of the following could be measured directly?

A) Hope
B) Health
C) Weight
D) Pain

45. Which of the following 4 alternatives is the most appropriate description about the 3 words – Michigan: Baikal: Nicaragua?

A) These are names of lakes
B) These are names of cities
C) These are names of European countries
D) These are names of trading centres

46. Which of the following is a type of bar graph?

A) Polygon
B) Histogram
C) Normal curve
D) Line graph

47. Which of the following is a part of healthful school environment ?

A) Site on suitable high land
B) Furniture of 'plus type' (gap between tables and chairs)
C) Natural light coming from front
D) One latrine for 500 students

48. Which of the following 4 alternatives is the most appropriate description about the 3 fruits – Peaches, Plums, Apricot?

A) These grow on creepers
B) These need hot climate
C) These are very expensive fruits
D) These have a hard stone inside

49. Which of the following 4 alternatives is the most appropriate description about the 3 words – Ebony: Rosewood: Mahogany?

A) These are trees of temperate regions B) These are hardwood trees
C) These yield good wood for fuel D) These are coniferous trees

50. Which of the following is included in spearheading the Fourth Industrial Revolution?

A) Steam Engine B) Electricity C) Robotics D) Computers

51. Which of the following is NOT included in the Fourth Industrial Revolution?

A) Artificial Intelligence B) Assembly line production
C) Cloud computing D) Simulation

52. Which of the following 4 alternatives is the most appropriate description about the 3 words – Stork: Goose: Duck?

A) These migrate to India from Siberia B) These are water birds
C) These are white D) These are endangered species

53. Which of the following 4 alternatives is the most appropriate description about the 3 words – Myosin, Collagen, Actin?

A) These are proteins B) These are enzymes
C) These are constituents of blood D) These are hormones

54. Which of the following 4 alternatives is the most appropriate description about the 3 words – Chlorine, Fluorine, Iodine?

A) These are inert gases B) These are gases at room temperature
C) These are transition elements D) These are halogens

55. Which of the following 4 alternatives is the most appropriate description about the 3 words – Rourkela, Durgapur, Bokaro?

A) They have steel plants B) They have coal mines
C) They have atomic power plants D) They have IITs

56. Which of the following 4 alternatives is the most appropriate description of Paradeep, Haldia, Kandla?

A) Industrial centres B) Ships
C) Port towns D) Coastal cities

57. Which of the following 4 alternatives is the most appropriate description about the 3 words – Wasp: Cricket: Beetle?

A) Insects B) Pathogens C) Microbes D) Pesticides

58. Which of the following 4 alternatives is the most appropriate description about the 3 words – Rinderpest:Anthrax: Diarrhea?

A) These are diseases caused by bacteria
B) These are plant pests
C) These are pathogens
D) These are infections of stomach

59. Which of the following 4 alternatives is the most appropriate description about the 3 words – Crocodile: Chameleon: Tortoise?

A) They are reptiles
B) They have hard shells
C) They live near water
D) They keep on changing color

60. Which of the following 4 alternativesis the most appropriate description about the 3 words – Sandstone: Limestone: Coal?

A) These are formed by metamorphic rocks
B) These are chemical minerals
C) These are found in river beds
D) These are formed in sedimentary rocks

61. Which of the following pair has the similar relationship as in Plant: Coal?

A) Crops: Manure
B) Animals: Oil
C) Cow: Milk
D) Fire: Smoke

62. Which of the following pair has the similar relationship as in Laboratory: Germs?

A) School: Students
B) Playground: Games
C) Library: Books
D) Observatory: Planets

63. Which of the following pair has the similar relationship as in Termite: Wood?

A) Neem: Cotton
B) Fiber: Jute
C) Thread: Cloth
D) Moth: Wool

64. Which of the following 4 alternatives is the most appropriate description about the 3 words – Coal, Iron, Mica?

A) Gold
B) Rock
C) Earth
D) Minerals

65. Which of the following food has the least Glycemic Index?

A) Rice
B) Milk
C) Banana
D) Barley

66. Which of the following pair has the similar relationship as in Pulp : Paper?

A) Rope : Hemp
B) Rayon : Cellulose
C) Thread : Needle
D) Yarn : Fabric

67. Which of the following pair has the similar relationship as in Kangaroo : Australia?

A) Whale : River
B) Elephant : Russia
C) Penguin : Antarctica
D) Zebra : India

68. Which of the following pair has the similar relationship as in infection : Illness?

A) Satisfaction : Appetite
B) Applause : Audience
C) Antidote: Disease
D) Rehearsal: Performance

69. Which of the following pair has the similar relationship as in Heart: Cardiology?

A) Brain: Physiology
B) History: Histology
C) Civics: Polity
D) Fossils: Paleontology

70. Which of the following 4 alternatives is the most appropriate description about the 3 words – Fly, Bee, Ant?

A) Cockroach B) Spider C) Termite D) Insect

71. Which of the following 4 alternatives is the most appropriate description about the 3 words – Bantu, Khasis, Maoris?

A) Tribal groups B) Herdsmen C) Pasture lands D) Mountaineers

72. Which of the following relates to Chirpodist as Orthopedist is related to bones?

A) Nails B) Sounds C) Feet D) Heart

73. Which of the following relates to histamine as food poisoning is related to Aflatoxin?

A) Allergy B) Headache C) Anthrax D) Contamination

74. Which of the following relates to metaphysics as physiology is related to biology?

A) Physics B) Statistics C) Mathematics D) Philosophy

75. Which of the following is an INCORRECTLY MATCHED pair?

A) Ethnology: Human races B) Herpetology: Snakes

C) Nidology : Nests D) Phycology : Algae

x-x-x

M.E.(Chemical with specialization in Environmental Engg.)

1. For which reaction order, the half-life of the reactant is half of the full-life time (time for 100% conversion) of the reactant?
A) Zero order B) Half order C) First order D) Second order

2. A spherical naphthalene ball of 2 mm diameter is subliming very slowly in stagnant air at 25 ^{0}C. The change in the size of the ball during the sublimation can be neglected. The diffusivity of naphthalene in air at 25 ^{0}C is 1.1 x 10^{-6} m^2/s. The value of mass transfer coefficient is B x 10^{-3}m/s, where B (up to one decimal place) is_____.
A) 2.1 B) 1.1 C) 3.1 D) 4.1

3. Which of the following can change if only the catalyst is changed for a reaction system?
A) Enthalpy of a reaction B) Activation energy
C) Free energy of the reaction D) Equilibrium constant

4. Adsorption on activated carbon is to be used for reducing phenol concentration in waste water from 0.04 mol/L to 0.008 mol/L. The adsorption isotherm at the operating temperature can be expressed as q = 0.025 $C^{1/3}$, where q is the phenol concentration in solid (mol/g solid) and C is the phenol concentration in water (mol/L). The minimum amount of solid (in g) required per litre of waste water (up to one decimal place) is_____.
A) 5.8 B) 6.0 C) 6.2 D) 6.4

5. For fanning friction factor *f* (for flow in pipes) and drag coefficient C_D(for flow over immersed bodies), which of the following statement is correct?
P: *f* accounts only for the skin friction
Q: C_D accounts only for the form friction
R: C_D accounts for both skin friction and form friction
S: Both *f* and C_D depends upon Reynolds number
T: For laminar flow through a pipe, *f* doubles on doubling the volumetric flow rate
A) R, S, T B) P, Q, S C) P, R, S D) P, Q, S, T

6. For the time domain function f (t) = t^2,which one of the following is the Laplace transform of $\int_0^t f(t)dt$?
A) $3/s^4$ B) $1/4s^2$ C) $2/s^3$ D) $2/s^4$

7. If f*(x) is the complex conjugate of f(x) = cos x + *i* sin x, then for real a and b,
$\int_a^b f * f(x)dx$ is always:
A) Positive B) Negative C) Real D) Imaginary

8. The unit of fugacity of is the same as that of the
A) Temperature B) Pressure C) Volume D) Molar concentration

9. From the following list, identify the properties which are equal in both vapor and liquid phases at equilibrium

P: density Q: temperature

R: chemical potential S: enthalpy

A) P and Q B) Q and R C) R and S D) P and S

10. In order to achieve same conversion under identical reaction conditions and feed flow rate for a non autocatalytic reaction of positive order, the volume of an ideal CSTR is

A) Always greater than that of an ideal PFR

B) Always smaller than that of an ideal PFR

C) Same as that of an ideal PFR

D) Smaller than that of an ideal PFR only for first order reaction

11. The local velocity of a fluid along a streamline can be measured by

A) Venturi meter B) Orifice meter C) Rotameter D) Pitot tube

12. A unit impulse response of a first order system with time constant τ and steady state gain K is given by

A) $\frac{1}{(K\tau)}e^{\frac{t}{\tau}}$ B) $Ke^{-\frac{t}{\tau}}$ C) $\tau Ke^{-t/\tau}$ D) $\frac{K}{\tau}e^{-t/\tau}$

13. In case of a pressure driven laminar flow of a Newtonian fluid of viscosity (μ) through a horizontal circular pipe, the velocity of the fluid is proportional to

A) μ B) μ^{-1} C) $\mu^{0.5}$ D) $\mu^{-0.5}$

14. In Blake Jaw crusher the angle between the jaws is usually

A) 5^0 B) 15^0 C) 30^0 D) 90^0

15. In order to produce fine solid particles between 5 and 10 μm, the appropriate size reducing equipment is

A) Hammer mill B) Fluid energy mill C) Jaw crusher D) Gyratory crusher

16. Slurries are most conveniently pumped by a

A) Syringe pump B) Gear pump C) Diaphragm pump D) Vaccum pump

17. Assuming the mass transfer coefficients in the gas and the liquid phase comparable, the absorption of CO_2 from reformer gas (CO_2+ H_2) into an aqueous solution of diethanolamine is controlled by

A) Gas phase resistance

B) Liquid phase resistance

C) Both gas phase and liquid phase resistance

D) Composition of the reformer gas

18. Which one of the following statements is correct for the surface renewal theory?

A) Mass transfer takes place at steady state

B) Mass transfer takes place at unsteady state

C) Contact time is same for all the liquid elements
D) Mass transfer depends only on the film resistance

19. In rolling of two math dice, the outcome of an experiment is considered to be the sum of the numbers appearing on the dice. The probability is highest for the outcome of _____.
A) 1/6 B) 2/6 C) 3/6 D) 5/6

20. A step change of magnitude 2 is introduced into a system having the following transfer function

$$G(s) = \frac{2}{s^2+2s+4}$$ .The percent overshoot is_____.

A) 15.5 B) 15.3 C) 16.5 D) 16.3

21. For estimation of heat capacity of a solid compound, one can use
A) Clapeyron equation B) Gibb's equation
C) Kopp's rule D) Trouton's rule

22. The molar density of water vapor at normal boiling point of water is 33 mol/m^3. The Compressibility factor under these conditions is close to which one of the following? R= 8.314 J/mol-K
A) 0.75 B) 1 C) 1.25 D) 1.5

23. In a pool boiling experiment, the following phenomenon were observed.
P. Natural convection
Q. Film boiling
R. Transition boiling
S. Nucleate boiling
What was the correct sequence of their occurrence?
A) P, Q, R, S B) S, R, Q, P C) Q, R, P, S D) P, S, R, Q

24. A wet solid is dried over a long period of time by unsaturated air of non-zero constant relative humidity. The moisture content eventually attained by the solid is termed as the
A) Unbound moisture content B) Bound moisture content
C) Free moisture content D) Equilibrium moisture content

25. For a Newtonian fluid flowing in a circular pipe under steady state conditions in fully developed laminar flow, the Fanning friction factor is
A) $0.046\ Re^{-0.2}$ B) $0.0014 + 0.125/(Re^{0.32})$
C) 16/Re D) 24/Re

26. Carbon black is produced by decomposition of methane as:
$CH_4\ (g) \rightarrow C\ (s) + 2H_2\ (g)$
The single pass conversion of methane is 60%. If fresh feed is pure methane and 25% of the methane exiting the reactor is recycled, then molar ratio of fresh feed stream to recycle stream is
A) 0.7 B) 1.5 C) 6.7 D) 9.0

27. The units of isothermal compressibility are

A) m^{-3} B) Pa^{-1} C) $m^3\ Pa^{-1}$ D) $m^{-3}Pa^{-1}$

28. The product of combustion of methane in atmospheric air (21% O_2 and 79% N_2) have the following composition on a dry basis:

Product	Mol%
CO_2	10.00
O_2	2.37
CO	0.53
N_2	87.10

The ratio of moles of CH_4 to the moles of O_2 in the feed stream is

A) 1.05 B) 0.60 C) 0.51 D) 0.45

29. The diameter of a drop of liquid fuel changes with time due to combustion according to the relationship; $D = D_0\ (1- t/t_b)$, while burning, the drop falls at its terminal velocity under Stokes law regime. The distance it will travel before complete combustion is given by

A) $\frac{D_0^2 \Delta\rho t_b\, g}{18\mu}$ B) $\frac{D_0^2 \Delta\rho t_b\, g}{36\mu}$ C) $\frac{D_0^2 \Delta\rho t_b\, g}{54\mu}$ D) $\frac{D_0^2 \Delta\rho t_b\, g}{108\mu}$

30. In a fully turbulent flow ($Re > 10^5$) in a pipe of diameter d for a constant pressure gradient, the dependence of volumetric flow rate of an incompressible fluid is

A) d^2 B) d C) $d^{2.5}$ D) d^4

31. The critical speed of ball mill of radius R, which contains balls of radius r is proportional to

A) $(R - r)^{-0.5}$ B)$(R-r)^{-1}$ C) (R-r) D) $(R-r)^2$

32. In constant pressure filtration, the rate of filtration follows the relation (V = filtrate volume, t = time, k = C = constants)

A) $\frac{dV}{dt} = kV + C$ B) $\frac{dV}{dt} = \frac{1}{kV+C}$

C) $\frac{dV}{dt} = kV$ D) $\frac{dV}{dt} = kV^2$

33. A sand mixture was screened through a standard 10 mesh screen. The mass fraction of the oversize material in feed, overflow and underflow were found to be 0.38, 0.79 and 0.22 respectively. The screen effectiveness based on the oversize is:

A) 0.50 B) 0.58 C) 0.68 D) 0.62

34. A gas (density = 1.5 kg/m^3, viscosity = 2 x 10^{-5} kg/m-s) flowing through a packed bed (particle size = 0.5 cm. porosity 0.5) at superficial velocity of 2 m/s causes a pressure drop of 8400 Pa/m. The pressure drop for another gas with density of 1.5 kg/m^3, viscosity of 3 x 10^{-5} kg/m-s, flowing at 3 m/swill be

A) 8400 Pa/m B) 18900 Pa/m C) 12600 Pa/m D) 16800 Pa/m

35. For the reaction $2R + S \rightarrow T$, the rates of formation of r_R,r_S and r_T of substances R, S and T are related by

A) $2r_R=r_S = r_T$ B) $2r_R=r_S = -r_T$ C) $r_R= 2r_S = 2r_T$ D) $r_R= 2r_S = -2r_T$

36. A centrifugal pump is used to pump water through a horizontal distance of 150 m and then raised to an overhead tank 10 m above. The pipe is smooth with an ID of 50 mm. What head (of water) must the pump generate at its exit to deliver water at a flow rate of $0.001 m^3/s$? The fanning friction factor *f* is 0.0062.

A) 10 B) 11 C) 12 D) 20

37. The experimental data for the reaction, $2A + B2 \rightarrow 2AB$ is

Expt. No.	[A]	[B]	Rate (mol s^{-1})
1.	0.50	0.50	1.6×10^{-4}
2.	0.50	1.00	3.2×10^{-4}
3.	1.0	1.00	3.2×10^{-4}

The rate equation for above data is

A) rate = $k[B_2]^2$ B) rate = $k[B_2]$ C) rate = $k[A]^2 [B]^2$ D) rate = $k[A]^2 [B]$

38. V_{mf} is the minimum fluidization velocity for a bed of particles. An increase in the superficial gas velocity from $2V_{mf}$ to 2.5 V_{mf} results in (all velocities are smaller than the entrainment velocities of the particles) no change in

A) Drag on the particles B) Drag on the column walls
C) The bed height D) The bed voidage

39. The range of standard current signal in process instruments is 4 to 20 Ma. The reason to choose 4 mA instead of 0 mA as minimum signal is (p-611)

A) To minimize resistive heating in instruments
B) To distinguish between signal failure and minimum signal condition
C) To ensure a smaller difference between maximum and minimum signals
D) To ensure compatibility with other instruments

40. Among the following, choose one that is an endothermic process.

A) Methanol synthesis B) Catalytic cracking
C) Ammonia synthesis D) Oxidation of Sulphur

41. Styrene is produced from ethylbenzene by the process of

A) Dehydrogenation B) Oxidation C) Alkylation D) Dehydration

42. The amplitude ratio for sinusoidal response is always equal to 1 for (597-24)

A) First order system B) Second order system
C) Transportation lag D) Proportional controller

43. For a proportional controller with gain K_c, the value of amplitude ratio (AR) and phase angle at all frequencies are respectively(597-36)

A) K_c and 0^0 B) K_c and 90^0 C) $1/K_c$ and 0^0 D) $K_c/2$and 0^0

44. If the control loop is to operate at a gain margin of 2.0, the gain of the proportional controller must equal (616-49)

A) 0.85 B) 2.87 C) 3.39 D) 11.50

45. Platinum-10%, rhodium-platinum thermocouple can be used from(598-38)

A) $0\ ^0$C to $63.074\ ^0$C B) $0\ ^0$C to 1064.43^0C

C) $630.74\ ^0$C to 1263.74^0C D) $630.74\ ^0$C to $1064.43\ ^0$C

46. Given the characteristic equation below, select the number of roots which will be located to the right of the imaginary axis, $s^4+5s^3- s^2- 17s + 12$ (619-66)

A) One B) Two C) Three D) Zero

47. In a shell and tube heat exchanger, clearance of the tube is generally (666-134)

A) Not less than one-fourth of the tube diameter or 3/16 inch

B) More than the tube diameter

C) Equal to the tube diameter

D) More in case of triangular pitch as compared to the square pitch tube layout

48. A reactor has been installed at a cost of □ 50000 and is expected to have a working life of 10 Years with a scrap value of □ 10000. The capitalized cost (in □) of the reactor based on annual compound interest rate of 5% is

A) 113600 B) 42000 C) 52500 D) 10500

49. A sale contract signed by chemical manufacturer is expected to generate a net cash flow of □ 250000 per year at the end of each year for a period of 3 years. The applicable discount rate (interest rate) is 10%. The net present worth of the total cash flow, is □

A) □ 750000 B) □ 683750 C) □ 621500 D) □ 332750

50. Commercially ethylene is produced from naphtha by

A) Catalytic cracking B) Catalytic dehydrogenation

C) Pyrolysis D) Hydrocracking

51. In a fluid catalytic cracking unit, the nature of the reactions occurring in the reactor and the regenerator is

A) Reactor-exothermic, Regenerator-exothermic

B) Reactor-exothermic, Regenerator-endothermic

C) Reactor-endothermic, Regenerator- exothermic

D) Reactor-endothermic, Regenerator-endothermic

52. Which one is desirable in gasoline but undesirable in kerosene?

A) Aromatics B) Mercaptans C) Naphthenes D) Paraffins

53. The characteristic equation for the system is:

$$s^3+ 9s^2+ 26s + 12 (2+ K_c) = 0$$

Using Routh test, the value of K_c that will keep the system on the verge of instability is

A) 20.9 B) 18.4 C) 17.5 D) 15.3

54. Prilling tower is found in the flow sheet for the manufacturing of

A) Ammonia B) Formaldehyde C) Superphosphate D) Urea

55. The main purpose of dam construction is

A) Irrigation B) Flood control

C) Hydroelectricity D) Provide water to industry.

56. When is world environmental day celebrated?

A) 28th May B) 5th June C) 28th June D) 5th July

57. The segment/segments of the environment, responsible for conservation of radiant energy to chemical energy (carbohydrate) through photosynthesis is/are

A) Hydrosphere B) Lithosphere

C) Atmosphere and lithosphere D) Biosphere

58. The main reserve of fresh water on earth surface is:

A) Ground water B) Rivers

C) Lakes D) Polar ice caps and glaciers

59. The conventional activated sludge process

A) Is physical/chemical process

B) Is asuspended growth process that is primarily anoxic and recycles solids from secondary clarifier

C) Requires little or no oxygen

D) Utilizes a living community of microorganisms

60. The phase in which the maximum growth of microorganisms occurs during the biological treatment of waste water during secondary treatment is called

A) Lag phase B) Log growth phase C) Stationary phase D) Decay phase

61. Which activated sludge mode is best able to treat high flows due to inflow/infiltration?

A) Complete mix B) Extended aeration C) Kraus process D) Step feed

62. Biological process is used to remove

A) Settleable solids B) Volatile solids C) Dissolved solids D) Colloids

63. Activated carbon is classified as which type of treatment?

A) Preliminary treatment B) Primary treatment

C) Secondary treatment D) Tertiary treatment

64. Which of these is used to remove odour?

A) Ultrafiltration B) Pressure sand filter

C) Activated carbon D) Nano filter

65. Which of these is the strongest disinfectant?
A) Ozone B) Chlorine C) Chlorine dioxide D) UV rays

66. Fresh water carrying pipelines in chemical industries are coloured with_____ color
A) Brown B) Sea green C) Yellow D) Red

67. In a shell and tube heat exchanger the "tube pitch" is defined as
A) O.D. of the tube for square pitch
B) Shortest distance between two adjacent tube holes
C) Longest distance between two adjacent tube holes
D) Shortest centre to centre distance between adjacent tubes

68. Pour point and freezing point is equal for
A) Petrol B) Crude petroleum C) Water D) Diesel

69. Which of the following is a detergent?
A) Benzene hexachloride B) Cellulose nitrate
C) Polyvinyl chloride D) Alkyl benzene sulphonate

70. 25per cent cut segmental baffle means that the baffle

A) Height is 75% of the I.D. of the shell B) Width is 25% of its height
C) Height is 25% of the I.D. of the shell D) Spacing is 75% of its height

71. Solvent used in deasphalting process is?
A) Furfural B) Phenol C) Propane D) Hexane

72. What is the specific humidity, if the mass of water is 10 g and mass of bone dry air is 20 g?
A) 10% B) 30% C) 50% D) 80%

73. How are the traces of organic compounds removed from the soil?
A) Denitrification B) Soil filtration C) Precipitation D) Sorption

74. Ethene is burnt with 50% of excess air, what is the percentage of CO_2 in the products?
A) 11.11% B) 36.36% C) 66.66% D) 72.72%

75. 80 kg of Na_2SO_4 (mol wt 142) is present in 330 kg of an aqueous solution. The solution is cooled such that 80 kg of $Na_2SO_4.10\ H_2O$ crystals separate out. The weight fraction of Na_2SO_4in the remaining solution is
A) 0.06 B) 0.18 C) 0.24 D) 1.00

x-x-x

M.E.Mechanical Engg. (Manufacturing Technology)

1 If the inverse of a matrix is equal to its transpose, then the type of the matrix is

A) Skew Hermitian
B) Skew symmetric
C) Orthogonal
D) Hermitian

2 Real part of the complex number $e^{5+i\pi}$ is

A) -1
B) $-e^5$
C) 1
D) e^5

3 If 150 dice are rolled, how many 5 as outcome are likely?

A) 30
B) 25
C) 33
D) 28

4 Atomic packing factor of fcc crystal structure is

A) 0.54
B) Same as that of bcc
C) 0.68
D) Same as that of hcp

5 Coordination Number (CN) in crystal structures is

A) Number of atoms at corners of the lattice
B) Number of electrons in the innermost shell of the atom
C) Number of equidistant atoms surrounding an atom in the lattice
D) Number of atoms sharing electrons in covalent bond

6 Which of the following is not a point defect?

A) Frenkel
B) Dislocation
C) Schottky
D) Impurity

7 Which of the following material has highest ductility?

A) Lead
B) Gold

C) Copper
D) Tin

8 Stainless steels are “stainless” because they contain high content of

A) Sulphur
B) Zirconium
C) Titanium
D) Chromium

9 Poise is the unit of

A) Density
B) Velocity gradient
C) Kinematic viscosity
D) Dynamic viscosity

10 The resultant hydrostatic force acts at a point known as

A) Centre of pressure
B) Centre of buoyancy
C) Centre of gravity
D) Centre of mass

11 The frictional head loss in turbulent flow through a pipe varies

A) Directly as the average velocity
B) Directly as the square of the average velocity
C) Inversely as the square of the average velocity
D) Inversely as the average velocity

12 The shear stress developed in a lubricating oil of viscosity 0.981 N-s/m^2, filled between two parallel plates 1 cm apart and moving with relative velocity of 2 m/s is

A) 196.2 N/m^2
B) 49 N/m^2
C) 19.62 N/m^2
D) 4.9 N/m^2

13 Which of the following is measured by a rotameter?

A) Velocity of fluids
B) Discharge of fluids
C) Viscosity of fluids
D) Density of fluids

14 Dimensional formula for Young’s modulus of elasticity is

A) $ML^{-1}T^{-2}$
B) MLT^{-2}

C) $M^{-1}L^{-1}T^{-1}$
D) $ML^{-2}T^{-2}$

15 The strain energy stored in a body due to external loading, within the elastic limit, is known as

A) Malleability
B) Ductility
C) Toughness
D) Resilience

16 Stiffness of material may be expressed in terms of

A) Mass density
B) Hardness number
C) Modulus of elasticity
D) Impact strength

17 The strain energy stored in a body of volume 'V' with stress 'σ' due to gradually applied load is

A) $(\sigma E)/2V$
B) $(\sigma E^2)/2V$
C) $(\sigma V^2)/2E$
D) $(\sigma^2 V)/2E$

18 Who postulated the maximum shear strain energy theory?

A) Tresca
B) Rankine
C) Mises – Henky
D) St. Venant

19 Two links, for which the relative motion is combination of sliding and turning nature, form a

A) Sliding pair
B) Lower pair
C) Turning pair
D) Higher pair

20 For simple harmonic motion, the graph between velocity and displacement is

A) Elliptical
B) Linear
C) Circular
D) Hyperbolic

21 In which of the following is Coriolis component encountered?

A) Slider crank mechanism
B) Double slider chain mechanism
C) Quick return mechanism

D) Both (A) and (C)

22 The centre of gravity of the coupler link in a four-bar mechanism would experience

A) No acceleration
B) Only linear acceleration
C) Only angular acceleration
D) Both linear and angular acceleration

23 Critical damping depends upon

A) Stiffness and amplitude
B) Mass and frequency of system
C) Mass and stiffness
D) Stiffness and viscosity of medium

24 Fourier analysis as a method of describing an arbitrary function by its

A) Mean amplitude
B) Frequency components
C) Phase lag
D) Rectification

25 The molecular kinetic energy of a gas is proportional to its absolute temperature as

A) T
B) $\sqrt{T}$
C) $T^{3/2}$
D) T^{2}

26 Which of the following thermodynamic cycle is used in steam engines?

A) Carnot
B) Bell-Coleman
C) Rankine
D) Brayton

27 For an adiabatic process, if volume is decreased then which of the following takes place?

A) Heat conduction
B) Increase in temperature and decrease in pressure
C) Decrease in temperature and pressure
D) Increase in temperature and pressure

28 The internal energy of a perfect gas does not change during

A) Adiabatic process
B) Isobaric process
C) Isothermal process
D) Isochoric process

29 If we heat wet steam at constant temperature, then which of the following is constant?

A) Pressure
B) Specific enthalpy

C) Specific volume
D) Entropy

30 The smallest change in the value of the input variable being measured , that will cause a change in the output signal of the instrument is called
A) Hysteresis
B) Drift
C) Resolution
D) Threshold

31 Thermistors, used for temperature measurement, are made of
A) Polymers
B) Semiconductors
C) Superconductors
D) None of the above

32 An orifice meter, used for flow measurement, is a type of
A) Variable area meter
B) Variable head meter
C) Linear resistance flow meter
D) Variable viscosity meter

33 Dynamometers are used for measurement of
A) Motion
B) Proximity
C) Power
D) Dynamic measurements

34 A J-type thermocouple is made of
A) Platinum-Constantan
B) Iron-Constantan
C) Iron-Alumel
D) Copper-Constantan

35 Chills are used in casting moulds to
A) Achieve directional solidification
B) Reduce possibility of blow holes
C) Reduce the freezing line
D) Increase the smoothness of cast surface

36 Misrun is a casting defect which occurs due to
A) Very high pouring temperature of metal
B) Insufficient fluidity of the molten metal
C) Absorption of gases by the liquid metal
D) Improper alignment of the moulds

37 The welding process using flux in the form of granules is

A) Gas welding
B) DC arc welding
C) Submerged arc welding
D) Plasma arc welding

38 Cold working of the metals is carried out
A) Below the recrystallisation temperature
B) At the recrystallisation temperature
C) Above the recrystallisation temperature
D) Working temperature depends upon the physical conditions of the workpiece

39 Spot welding, projection welding and seam welding belong to the category to
A) Arc welding
B) Thermit welding
C) Forge welding
D) Electric resistance welding

40 Which of the following processes is most commonly used for forging of bolt heads of hexagonal shape?
A) Closed die drop forging
B) Open die upset forging
C) Closed die press forging
D) Open die progressive forging

41 In metal casting, compensation for shrinkage is provided by
A) Oversize pattern
B) Properly placed risers
C) Promoting directional solidification
D) Chills

42 In press operation, the size of the blank depends upon
A) Size of punch
B) Size of die
C) Mean size of punch and die
D) Die size and clearance

43 Which of the following is not orthogonal cutting process?
A) Sawing
B) Broaching
C) Slotting
D) Milling

44 During turning, thrust force will increase with the increase in
A) Side cutting edge angle
B) Tool nose radius
C) Rake angle

D) None of the above affects thrust force

45 In a single point turning operation with cemented carbide and steel combination, Taylor exponent is 0.25. If the cutting speed is halved, the tool life will become
A) Half
B) Double
C) Four times
D) Sixteen times

46 Factor of safety for fatigue loading is expressed as ratio of
A) Yield strength to working stress
B) Ultimate strength to design stress
C) Endurance limit to allowable stress
D) Yield strength to ultimate strength

47 To ensure self-locking in a screw jack, it is essential that helix angle is
A) Larger than friction angle
B) Smaller than friction angle
C) Equal to friction angle
D) None of the above

48 In the Lewis equation, the working stress depends upon
A) Material of the tooth and pitch line velocity
B) Pitch line velocity and load conditions
C) Load conditions and material of the tooth
D) Pitch line velocity, Load conditions and material of the tooth

49 Riveted joints are designed on the basis of
A) Thickness of plates
B) Rivet length
C) Rivet diameter
D) Hardness of plate material

50 Splined shafts are used for
A) Impact loads
B) Axial movement of hub on shaft
C) Absorbing vibrations
D) High bending stress

51 Which of the following is a trapezoidal thread?
A) Acme
B) Square
C) Buttress
D) U-threads

52 The rated life of a bearing varies

A) Directly as load
B) Inversely as square of load
C) Inversely as cube of load
D) Directly as square of load

53 In the assembly of shaft, pulley and key
A) Pulley is designed as weakest
B) Key is designed as weakest
C) Key is designed as strongest
D) All are designed for equal strength

54 A transmission shaft subjected to bending loads must be designed on the basis of
A) Maximum normal stress theory
B) Maximum shear stress theory
C) Both (A) and (B)
D) Fatigue strength

55 Which of the following components is not part of pneumatic system power supplies?
A) Motor
B) Pressure relief valve
C) Filter
D) Accumulator

56 A pilot operated directional control valve in pneumatic actuation systems is operated by
A) Pressurized air
B) Manually
C) Spring
D) None of the above

57 The graphical symbol for a 4/2 directional control valve consists of
A) 4 squares
B) 2 squares
C) 3 squares
D) 8 squares

58 Terms such as ‘spool type’ and ‘poppet type’ refer to which of the following components in fluid power systems
A) DC valves
B) Linear cylinders
C) Power supplies
D) Rotary cylinders

59 In automobiles, the distributor is
A) A system for distributing load on the four wheels
B) A rotary switch that connects the ignition coil to various spark plugs
C) A system that connects the master brake cylinder to wheel brake cylinders
D) A section of the drivetrain

60 A low air/fuel ratio is what type of mixture?

A) Lean
B) Rich
C) Poor
D) Fat

61 In CAD, wire-frame modeling is used in

A) 1-D modeling
B) 2-D modeling
C) 3-D modeling
D) 4-D modeling

62 In solid modeling, models are constructed using simple 3-D shapes called

A) Basic Solids
B) 3-D Solids
C) Primitives
D) Cuboids

63 The UCS icon represents the intersection of

A) X-axis and Y-axis
B) X-axis, Y-axis and Z-axis
C) Y-axis and Z-axis
D) X-axis and Z-axis

64 The two most widely used schemes to create solid models in CAD are CSG and

A) s-rep
B) p-rep
C) 3-rep
D) b-rep

65 CAD and CAM are linked through

A) A common database
B) NC tape programming
C) Automation
D) Testing and analysis

66 A geometric model that shows all the edges of an object is called

A) Surface model
B) Solid model
C) Wire-frame model
D) 3-D model

67 NC contouring is an example of

A) Continuous path positioning

B) Point-to-point positioning
C) Absolute positioning
D) Incremental positioning

68 In NC programming, G02 refers to
A) Incremental dimensioning
B) Circular interpolation in counter-clockwise direction
C) Absolute dimensioning
D) Circular interpolation in clockwise direction

69 Decimal number 10 is equal to binary number
A) 1110
B) 1010
C) 1000
D) 1100

70 The full form of PROM is
A) Processor Read Only Memory
B) Programmable Read Only Memory
C) Programmable Register Only Memory
D) Processor Register Only Memory

71 RPY in robotics refers to
A) Manipulator configuration
B) Wrist configuration
C) Control algorithm
D) Special tool

72 Which type or types of actuators are used for actuating robot joints?
A) Electric actuators only
B) Hydraulic actuators only
C) Pneumatic actuators only
D) All of the above

73 Which type of gripper is suitable for handling flat glass sheets?
A) Permanent Magnetic type
B) Mechanical fingers
C) Vacuum cup
D) Electromagnet type

74 Servomotors are dc motors having
A) Encoders
B) Thermistors
C) Anemometer
D) Dynamometers

75 The maximum torque that can be applied to a powered motor without causing shaft rotation is called

A) Maximum torque
B) Stationary torque
C) Threshold torque
D) Holding torque

x-x-x

MSc(HS/2Yr)(Biotechnology)

1. This technique for separation of charged molecules based on varying rates of migration through a solid matrix when subjected to an electric field is known as

A) Autoradiography B) Spectrophotometry
C) Electrophoresis D) Blotting

2. Which of the following is an example of incomplete dominance?

A) AB blood group B) Mirabilis jalapa
C) Shape of crown in poultry D) Mouse coat colour

3. GRAIL is an example of a type of algorithm used for searching genes in DNA sequence

A) Neural network B) Rule based system
C) Hidden markov model D) Wide network

4. What is an apoenzyme?

A) It is a non-protein group
B) It is a protein portion of an enzyme
C) It is a complete, biologically active conjugated enzyme
D) It is a prosthetic group

5. Name the acid present in the cell wall of bacteria which helps in retaining its color during the acid-fast test?

A) Malic acid B) Teichoic acid C) Mycolic acid D) Tartaric acid

6. What is the unit of a genetic map?

A) Nanometer B) Centimeter C) Angstrom D) Centimorgan

7. . ……bond is used to stabilize the double helix of DNA.

A) Hydrogen bond B) Hydrophobic bond
C) Ionic bond D) Covalent bond

8. Which technique is used for the amplification of random DNA sequences from any species by the use of a single primer?

A) RFLP B) RAPD C) SSLP D) AFLP

9. When mammalian cells are irradiated, they stop dividing and arrest at a G1 checkpoint. Place the following events in the order in which they occur.

i) Production of p21

ii) DNA damage

iii) Inactivation of cyclin-Cdk complex

iv) Activation of p53

A) i, ii, iii, iv B) iv, iii, ii, I C) iii, ii, i, iv D) ii, iv, i, iii

10. Which of the following methods could provide structural information regarding the secondary structures of a protein?

A) Mass spectrometry B) Circular dichroism spectroscopy

C) Visible light spectroscopy D) Fluorescence spectroscopy

11. CsCl gradient centrifugation helps in separation of DNA and the basic principle involved is- DNA fragments can move and accumulate at a position where the density of the two (DNA and CsCl) is same. What will happen when both circular and linear DNA is present together?

A) Circular DNA will pellet while linear DNA will form a band
B) Linear DNA will pellet while circular DNA will form a band
C) Linear and circular DNA will form separate band
D) Both Linear and circular DNA will float at top

12. Photochemical smog is due to the presence of …….pollutant

A) NO B) SO_2 C) CO_2 D) CO

13. Cancer is often the result of activation of ____ to ____ and the inactivation of ____ genes.

A) oncogenes, proto-oncogenes, tumor-suppressor gene
B) proto-oncogenes, oncogenes, tumor-suppressor genes
C) oncogenes, tumor-suppressor genes, proto- oncogenes
D) proto-suppressor genes, suppressors, oncogenes

14. The major difference between hormones that have intracellular receptors and those that have cell membrane receptors is that the former tend to be

A) Larger B) Charged
C) Amino acid derivatives D) Hydrophobic

15. What is the name the secondary structure of tRNA?

A) Cloverleaf B) L-shaped C) Duplex D) Triple Helix

16. Which of the following rRNA molecules have peptidyl transferase activity in prokaryotes?

A) 5S rRNA B) 28S rRNA C) 23S rRNA D) 18S rRNA

17. Which three amino acids absorb in the near UV region are

A) tryptophan, tyrosine, aspragine B) tyrosine, histidine, tryptophan

C) tryptophan, tyrosine, and phenylalanine D) histidine, phenylalanine and tyrosine

18. Necrosis differs from apoptosis in that necrosis

A) Occurs more frequently
B) Causes DNA to fragment
C) Uses a caspase cascade
D) Causes cells to swell and burst while apoptotic cells shrink and condense

19. At what stage of cell cycle retinoblastoma act as check point

A) M→G1 B) G1→S C) S→G2 D) S

20. The secondary structure of a protein consists of all but one of the following. Which is the odd one out?

A) α-helices B) β-sheets C) Turns D) Disulfide bridges

21. Which of the following is not part of the lac operon of E. coli?

A) Genes for inducible enzymes of lactose metabolism
B) Genes for the repressor, a regulatory protein
C) Gene for RNA polymerase
D) A promoter, the RNA polymerase binding site

22. Dhfr is a marker used for in situ gene amplification and utilizes ……..as amplifying selective drug

A) Deoxycoformycine B) Methotraxate
C) Aminopterin D) Mycophenolic acid

23. Homeobox sequences

A) Are present in the genome of many animal species

B) Are found in prokaryotes but not in eukaryotes

C) Were identified as the integration sites for bacterial viruses

D) Represent integration sites for transposable elements

24. Which vector can carry largest piece of DNA

A) Plasmid B) Phage C) Cosmid D) BAC

25. What is true about microscopy?

A) TEM gives internal details of the specimen in contrast to SEM.

B) Phase contrast microscopy is not useful to identify the shape of living cell

C) SEM also provides a 2-d image while TEM provides a 3-d picture

D) Both A and B

26. Short DNA sequences which replicate and are inserted around the genome are known as

A) Selfish DNA
B) Satellite DNA
C) Transposable DNA
D) Tandem Repeats

27. The structure of all amino acids are same except for …..amino acid

A) Lysine B) Glycine C) Proline D) Alanine

28. Which of these amino acid are found very less in a protein?

A) Leucine and serine
B) Lysine and glutamic acid
C) Tryptophan and methionine
D) Leucine and lysine

29. QTL analysis is used to:

A) Identify chromosome regions associated with a complex trait in a genetic Cross

B) Map genes in bacterial viruses

C) Determine which genes are expressed at a developmental stage

D) Identify RNA polymerase binding sites

30. Denaturation of protein leads to loss of biological activity by

A) Formation of amino acid
B) Loss of primary structure
C) Loss of both primary and secondary structure
D) Loss of secondary and tertiary structure

31. Which of the following hormone is not used in the hydrolysis of triacylglycerol into the fatty acids in adipose tissues?

A) Epinephrine B) Norepinephrine C) Glucagon D) Insulin

32. Assuming Hardy-Weinberg equilibrium, the genoypte frequency of heterozygotes, if the frequency of the two alleles at the gene being studied are 0.6 and 0.4, will be:

A) 0.80 B) 0.64 C) 0.48 D) 0.32

33. The expression library contains

A) Whole genome
B) Only coding sequences
C) Only non coding sequences
D) cDNA representing mRNA

34. Mapping of human chromosomes:

A) Proceeded much more successfully as large numbers of DNA markers became available.

B) Has been restricted to the sex chromosomes because of small family sizes

C) Has determined that the number of linkage groups is about twice the number of chromosomes

D) Has demonstrated that almost all of the DNA is involved in coding for genes

35. The monomeric unit of nucleic acid are called _____
A) Nucleotides B) Nucleosides C) Purines D) Pyrimidines

36. Which of the following ensure stable binding of RNA polymerase at the promoter site?
A) RecA B) Sigma factor C) DNA photolyase D) DNA glycosylase

37. What is the binding energy?
A) Free energy released in the formation of enzyme-substrate interaction
B) The energy required to form a bond
C) The energy required to bind substrate
D) It is the activation energy

38. The law of independent assortment is inferred by
A) Test cross B) Monohybrid cross
C) Dihybrid cross D) Back cross

39. In which plasmid copy number control is lost?
A) F plasmid B) BAC vector C) pBR 322 D) pUC 18

40. Traditional method for the commercial production of citric acid is by
A) Solid state fermentation B) Continuos fermentation
C) Synchronous production D) Batch fermentation

41. Short DNA sequences which replicate and are inserted around the genome are known as
A) Tandem Repeats B) Selfish DNA
C) Transposable DNA D) Satellite DNA

42. What is the maximum percentage of recombination frequency between two genes?
A) 25% B) 50% C) 75% D) 100%

43. Peptide chain elongation involves all the following except
A) Peptidyl transferase B) GTP
C) Tu, Ts and G factors D) Formyl tRNA

44. The pathway for glucose synthesis by non-carbohydrate precursors is

A) Glycogenolysis B) Glycolysis

C) Glycogenesis D) Gluconeogenesis

45. Antisense technology

A) Selectively blocks expression of a gene

B) Combines organelle of a cell

C) Alters on transfer cells

D) None of these

46. Name the heavy chain of immunoglobulin G.

A) μ B) ε C) α D) γ

47. In a sieve chromatography

A) Smaller proteins enter the beads more readily

B) Large proteins elute first

C) Large proteins enter the beads more readily

D) Both A and B

48. The cells which has potential to develop and form an entire organism are known as

A) Totipotent cell B) Multipotent cells

C) Pleuripotent cells D) Adult stem cell

49. Which of the following is NOT the step of mRNA processing?

A) 5' capping B) Splicing of introns

C) RNA silencing D) Polyadenylation

50. Which molecule in affinity resin is used to purify His-tagged proteins

A) GST B) Maltose C) CM cellulose D) Nickel NTA

51. Catabolic repression is

A) Repression of His operon by Histidine B) Repression of lac operon by IPTG

C) Repression of lac operon by glucose D) Repression of Trp operon by trptophan

52. Mitochondrial DNA is advantageous for evolutionary studies because:

A) It is inherited only through the female parent and thus evolves in a way that allows trees of relationship to be easily constructed

B) It is inserted into the X chromosome

C) It first appeared in humans and is not found in other animals

D) It evolves more slowly than the genes in the nucleus

53. Which of the following organisms have thick peptidoglycan in their cell wall?

A) Yeast B) Molds

C) Gram-positive bacteria D) Gram-negative bacteria

54. Major Histocompatibility Complex is a tight cluster of linked_____
A) Proteins B) Carbohydrates C) Lipid molecules D) Genes

55. Mutagenicity of a given compound is checked with the use of
A) lac- Salmonella B) trp- Salmonella
C) his- Salmonella D) ara- Salmonella

56. Expression of a housekeeping gene would be an example of a
A) Control B) Standard
C) Exogenous normalizing variable D) Endogenous normalizing variable

57. Isoscizomers are the restriction enzymes which
A) Show 50% homology in the recognition site
B) The recognition site of one enzyme is present in the recognition site of other enzyme
C) Show no homology in recognition sequence
D) These are GC rich

58. Which of the following is X-linked recessive disorder?
A) Sickle cell anemia B) Color blindness
C) Albinism D) PTC tasting

59. UV mediated damage of DNA is repaired by
A) DNA glycosylase B) Nucleotide excision repair
C) Exchange of homologous segments D) Photoreactivation

60. Which of the following is an upstream process in fermentation?
A) Product recovery B) Product purification
C) Media formulation D) Cell lysis

61. Mark the one, which is NOT a lymphoid progenitor cell.
A) Monocyte B) B-cell C) T-cell D) NK cells

62. Insertion of cry gene in plant genome provides
A) Herbicide resistance B) Virus resistance
C) Insect resistance D) Drought resistance

63. Name the sequence of RNA, which is recognized by a small subunit of the ribosome.
A) Rho utilization site B) Downstream sequence
C) Upstream sequence D) Shine Dalgarno sequence

64. In PCR reactions Pfu is preferred over Taq as Pfu

A) Is more thermostable B) Is optimally active at higher temperature

C) Provides high fidelity D) Was declared as molecule of the year 1989

65. What is an Isozyme?

A) Same structure, different function B) Different structure, the same function

C) Same structure, the same function D) Different structure, different function

66. The term "prey" is associated with which type of hybrid

A) DBD hybrid B) AD hybrid

C) Reverse two hybrid D) Yeast hybrid

67. Which of the following protein does not involve in the initiation of replication?

A) DnaA B) DnaB

C) DnaF D) SSB (Single strand binding protein)

68. In a cross between a white-eyed female fruit fly and red-eyed male, what percent of the male offspring will have white eyes? (White eyes are X-linked, recessive)

A) 100% B) 50% C) 25% D) 0%

69. Synthesis of DNA from RNA is carried out by

A) Transpeptidase B) DNA polymerase I

C) RNA polymerase D) Reverse transcriptase

70. Inclusion bodies can be solubilized in

A) 6.0 M Gdn HCl B) 0.6M Tris HCl

C) 0.6M Phosphate buffer D) 0.6M Borate buffer

71. Ethidium bromide staining is used to stain

A) Proteins B) Lipids C) Nucleic acids D) Carbohydrates

72. The famous experiment by Avery et al reported that

A) Transformation B) DNA as transforming agent

C) RNA as transforming agent D) Replication is semiconservative

73. To amplify a DNA sequence 5' gcattaggcactgggatatctcagctgacacgtatgc 3', the following primer can be used for this sequence

A) 5'gcattaggcact B) 3' gcattaggcact C) 5' gcatacgtgtc D) 3' gcatacgtgtc

74. Name the coenzyme of riboflavin (B2)

A) NAD or NADP
B) FAD and FMN
C) Coenzyme A
D) Thiamine pyrophosphate

75. Mitochondria from cell homogenate can be pelleted out by centrifugation at

A) 1000Xg
B) 2000Xg
C) 5000Xg
D) 10000Xg

x-x-x

LLM

1. Indian Constitution allows **"**Declaration of One's religious beliefs and faith openly and freely". This falls under which of the following categories?

A) Right to Practice B) Right to Propagate
C) Freedom of Conscience D) Right to Profess

2. Discrimination on the grounds of "Place of residence" only is prohibited under which one of the following articles of the Constitution?

A) Article 14 B) Article 15 C) Article 16 D) None

3. Which of the following safeguards are available to the Indian Citizens as per Article 22 of the Indian Constitution?

1. No person accused of any offence shall be compelled to be witness against himself.
2. The detention of persons, who are detained under preventive detention law, cannot exceed two months without obtaining the opinion of an advisory board.

A) 1 only B) 2 only C) Both D) None

4. Who among the following is called the "guardian of the public purse" of India?

A) Comptroller & Auditor General
B) Finance Minister
C) Chairman of Public Accounts Committee
D) Prime Minister

5. The Swaran Singh Committee recommended:

A) The Constitution of State-Level Election Commissions
B) Panchayati-Raj reforms
C) Inclusion of Fundamental Duties in the Indian Constitution
D) Interlinking of Himalayan and peninsular rivers

6. Article 43 B in Part IV of the Constitution of India deals with:

A) Rural Business Hubs B) Cooperative Societies
C) Village Panchayats D) Forest Development

7. A bill which affects the meaning of expression, which among the following, can be introduced in the parliament only on recommendation of President of India?

A) Foreign Loans B) Corporation Tax
C) Agriculture Income D) Export Duties

8. Which one of the following State Legislature does not have two houses?

A) Karnataka B) Maharashtra C) Tamil Nadu D) Jammu and Kashmir

9. Which among the following bodies do not have the powers of Civil Court as part of their duties?

A) National Commission for SCs B) National Commission for STs
C) Union Public Service Commission D) None of the Above

10. Central Social Welfare Board is/falls under

A) Ministry of Women and Child Development
B) Ministry of Social Justice and Women Empowerment
C) An Autonomous and Independent body
D) Ministry of Minority Affairs

11. In issuing one of the writs, the Supreme Court orders: "the respondent was not entitled to an office he was holding or a privilege he was exercising" The above declaration can be identified as which among the following writs?

A) Writ of Prohibition
B) Writ of Quo-warranto
C) Writ of Certiorari
D) Writ of Habeas Corpus

12. Which of the following schedules can be amended by simple majority of Parliament.

1. Second Schedule.
2. Fifth Schedule.
3. Sixth Schedule
4. Seventh Schedule.

A) 1 only
B) 1 & 4 only
C) 2 & 3 only
D) 1, 2 & 3 only

13. Which among the following is NOT a salient feature of the 73rd Constitutional Amendment Act?

A) Gram Sabha
B) Three Tier System
C) Reservation of Seats
D) State Planning Commission

14. Which amendment of the constitution was offered full statehood to Arunachal Pradesh?

A) Fifty-Fifth
B) Sixtieth
C) Forty-Fourth
D) Sixth-Fifth

15. Under the provisions of Article 343 of the Constitution, Hindi was declared the official language of the Union. But the use of English language was allowed to continue for the official purpose of the Union for a period of:

A) 20 years
B) 15 years
C) 25 years
D) 10 years

16. Who said that Directive Principle and Fundamental Rights are the conscience of the Constitution?

A) Bhim Rao Ambedkar
B) Granville Austin
C) Jawaharlal Lal Nehru
D) Rajendra Prasad

17. Under the constitution of India, which one of the following is not a fundamental duty?

A) To vote in public elections
B) To develop the scientific temper
C) To safeguard public property
D) To abide by the Constitution and respect its ideals

18. The distribution of powers between the Centre and the States in the Indian Constitution is based on the scheme provided in the:

A) Morley-Minto Reforms, 1909 B) Montagu-Chelmsford Act, 1919
C) Government of India Act, 1935 D) Indian Independence Act, 1947

19. Consider the following official languages of India:

1. Sindhi and Nepali
2. Konkani and Manipuri
3. Bodo and Santhali
4. Santhali and Konkani
5. Dogri and and Maithili

Which of the above languages were added to the 8th Schedule by the 92nd Amendment Act of 2003?

A) 1 and 2 B) 2 and 3 C) 3 and 5 D) 4 and 5

20. Democracy and Federalism are essential features of our Constitution and basic feature of its structure. This observation was made in S.R. Bommai vs. Union of India by the Judge.

A) Justice P.B. Sawant B) Justice S.R. Pandyan
C) Justice J.S. Verma D) Justice A.M. Ahmadi

21. The Hon'ble Supreme Court in 2006 decided the constitutional validity of the Act which seeks to levy sale tax on Inter-State Sales:

A) Bhagatram Rejeev Kumar v. Commissioner of Sales Tax
B) Jindal Stainless Ltd. & another v. State of Haryana and others
C) State of Bihar v. Bihar Chamber of Commerce
D) **Jaiprakash Associates Ltd. v State of M.P**

22. Necessitas Public Major est Quam latin terms means

A) State necessity is greater than private necessity
B) Public necessity is greater than private necessity
C) Private necessity is greater than state necessity
D) None of above

23. The Constituent assembly while enacting Freedom of Trade, Commerce and Intercourse took into the consideration

A) Section 90 of Australian Constitution
B) Section 91 of Australian Constitution
C) Section 92 of Australian Constitution
D) Section 93 of Australian Constitution

24. Keshvanand Bharathi v. State of Kerala the Supreme Court declared Second part of Article _____ declared invalid.

A) 31 C B) 31 B C) 31 A D) 31

25. Article 300 A was enacted through _____ Amendment Act.

A) Forty-second B) Forty-third C) Forty-fourth D) None of these

26. In the case Bachpan Bachao Andolan v. Union of India the children were prohibited to work in

A) Circus B) Match Industry
C) Tobacco Industry D) None of these

27. In the case *State of Gujarat v. Hon'ble High Court of Gujarat* the matter relating to fixation of wages with regard to _____ was deliberated.

A) Labourers B) Prisoners C) Child Workers D) None of these

28. 'Child Labour Rehabilitation-cum-Welfare Fund" was established in the following case:

A) M.C. Mehta v. State of Tamil Nadu & others
B) Bachpan Bachao Andolan v. Union of India
C) P.U.D.R v. Union of India
D) Gurdev Singh v. State of Himachal Pradesh

29. In which year the Traditional Forest Dwellers Act was enacted in India?

A) 2004 B) 2005 C) 2006 D) 2008

30. The Environment Protection Act of 1986 (EPA) came into force soon after which of the following disaster in India?

A) Bhopal Gas Tragedy B) Oleum Gas Leak
C) Maline Landslide in Pune D) None of these

31. The Kigali agreement was an amendment to which of the following international conventions aimed at conserving the environment?

A) Montreal Protocol B) Stockholm Convention
C) Bonn Convention D) Kyoto Protocol

32. Which among the following terms of utmost significance in the dynamics of resource management was coined in the 'Brundtland Commission Report'?

A) Polluter-Pays Principle B) Sustainable development
C) Inclusive Growth D) Carrying Capacity

33. Which among the following multilateral convention seeks to protect the human health and environment from Persistant Organic Pollutants (POPs)?

A) Bonn Convention B) Stockholm Convention
C) Rotterdam Convention D) Basel Convention

34. "Bias disqualifies a person from acting as judge" flows fromwhich ofthe following principle:

A) No one should be the judge in his own
B) Justice must not only be done under dictation
C) Justice should be supposed to be done
D) Justice should not be done under dictation

35. The expression "New Despotism" used by Hewart refers to:

A) Administrative law B) Constitutional law
C) Rule of law D) Public law

36. What is the meaning of collective rights?
A) Collective rights belong to distinct groups of people
B) Collective rights are those that belong to particular groups as opposed to the individual members of the group
C) Minority rights are collective rights
D) Collective rights entail a right of the group as such as well as individual rights of the group's members

37. The Right to Self-determination is _____ generation human right.
A) First B) Second C) Third D) None of these

38. Which of the following is a treaty-based human rights mechanism?
A) The UN Human Rights Committee
B) The UN Human Rights Council
C) The UN Universal Periodic Review
D) The UN special mandates

39. Would a reservation to the definition of torture in the ICCPR be acceptable in contemporary practice?
A) This is an acceptable reservation if the reserving country's legislation employs a different definition
B) This is an unacceptable reservation because it contravenes the object and purpose of the ICCPR
C) This is an unacceptable reservation because the definition of torture in the ICCPR is consistent with customary international law
D) This is an acceptable reservation because under general international law States have the right to enter reservations to treaties

40. What is the legal nature of the Universal Declaration of Human Rights (UDHR)?
A) The UDHR is a multilateral treaty
B) The UDHR is a UN General Assembly resolution
C) The UDHR is a UN Security Council resolution
D) The UDHR is a declaration adopted by several States at an international conference

41. What is the effect of violation of the rule: "Audi Alteram Partem" on an administrative action?
A) Mere irregularity B) Null and void
C) An illegality D) Voidable

42. In which of the following cases, the Supreme Court held that the principles of natural justice are applicable to administrative proceedings?
A) M.C. Mehta v. Union of India

B) Maneka Gandhi v. Union of India
C) A.K. Kraipak v. Union of India
D) Smt. Indira Nehru Gandhi v. Raj Narain

43. In which of the following cases, the Supreme Court directed closing down and demolition of shrimp industries in coastal regulation zone and implement the "precautionary principle" and "the polluter pays principle and held them liable for payment of compensation for reversing the ecology and compensate the individual for loss suffered?
A) S. Jagannath Vs. Union of India
B) Vellore Citizens Welfare Forum Vs. Union of India
C) M.C. Mehta Vs. Union of India
D) Church of God (Full Gospels) in India Vs. KKR Majestic Colony Welfare Association

44. The term "environment" under Section 2 (a) of the Environment (Protection) Act, 1986 means
A) Air, Water and Land only
B) Water, Air, Land and interrelationship between air, water, and land only
C) Water, Air, Land, and the interrelationship between water, air and land and human beings, other living creatures, plants, micro-organism and property
D) None of the above

45. According to Article 233 the appointment of a District Judge shall be done by
A) The President in consultation with the High Court of the State concerned
B) The Governor of the State concerned in consultation with the High Court of the State concerned
C) The Governor in Consultation with the Chief Justice of India
D) The Collegium of the High Court

46. Which of the following Articles of the Indian Constitution gives the provision of the Post of Prime Minister of India?
A) Article 73 B) Article 74 C) Article 75 D) Article 74(1)

47. Who defined administrative law as; "Law relating to the Administration It determines the organisation, powers and duties of administrative authorities"?
A) Sir Ivor Jennings B) A.V. Dicey
C) Kenneth Culp Davis D) Griffith and Strut

48. One is deemed to have placed under suspension is he is detained in custody for a period exceeding
A) 48 hours B) 24 hours C) 72 hours D) 12 hours

49. When will the order of suspension made or deemed to have been made, not be valid unless extended? After a period of ___ days
A) 60 days B) 90 days C) 30 days D) 45 days

50. Penalties are listed in

A) Rule 14 of CCS(CCA)Rules B) Rule 3 (1) of CCS(Conduct) Rules
C) Rule 16 of CCS(CCA) Rules D) Rule 11 of CCS(CCA) Rules

51. According to Criminal Law (Amendment) Act, 2013, the right of private defence of the body extends to the voluntary causing of death or of any other harm to the assistant if the offence which occasions the exercise of the right is the act of:

A) Stalking B) Voyeurism C) Acid Attack D) None of these

52. Section 34 of IPC:

A) Creates a substantive offence B) Is a rule of evidence
C) Both (A) and (B) D) Neither (A) nor (B)

53. How many types of punishments have been prescribed under the Indian Penal Code:

A) Three B) Six C) Five D) Four

54. Match List I (case) with List II (Subject) and select the correct answer using the codes given below the lists:

List I (Cases)	List II (Subject)
a) K.M. Nanavati vs. State of Maharastra	1) Criminal Conspiracy
b) Virsa Singh vs. State of Punjab	2) Dacoity
c) Barindra Kumar Ghosh vs. Emperor	3) Murder
d) ShyamBehari vs. State of U.P.	4) Grave and Sudden Provocation
	5) Unsoundness of Mind

Codes:

	a	b	c	d
A)	4	3	1	2
B)	1	2	5	3
C)	4	2	1	3
D)	1	3	5	2

55. Which of the following is the principle applied in construing a penal Act?

A) If, in any construing the relevant provisions, "there appears any doubt of ambiguity," it will be resolved against the person who would be liable to the penalty
B) If, in any construing the relevant provisions, "there appears any doubt of ambiguity," it will be resolved in the favour of the person who would be liable to the penalty
C) If, in any construing the relevant provisions, "there appears any doubt of ambiguity," it will attract life imprisonment
D) If, in any construing the relevant provisions, "there appears any doubt of ambiguity," it will attract capital punishment

56. Which of the following statements best expresses the scope of the concept of relevance in evidence law?

A) Relevant evidence is that which establishes the certainty of a fact in issue incorrect
B) All relevant evidence is admissible
C) Relevant evidence is that which makes the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence
D) What is relevant is always a matter of logic and common sense and never a matter of law

57. A party wants to set aside a judgement under section 44 of the Indian Evidence Act, 1872. In which of the following circumstances can he do so?
A) In case the judgement was passed by a superior Court
B) In case the person challenging is a stranger to the proceedings
C) In case the judgement was a result of gross negligence
D) All of these

58. B, an accused wants to submit carbon copy of the suicide note as secondary evidence. The original is with the opposite party and he has failed to produce the same. The suicide was not within the knowledge of the accused prior to the receipt of carbon copy. Which of the following statements will hold true for the case?
A) The evidence cannot be admitted due to applicability of section 30 of the Indian Evidence Act
B) The evidence cannot be admitted because it fails to satisfy the requirements of section 64 of the Indian Evidence Act, 1872
C) The evidence cannot be admitted because it fails to satisfy the requirements of section 65 of the Indian Evidence Act, 1872
D) The evidence can be admitted as it satisfies the requirements of both section 64 and section 65 of the Indian Evidence Act, 1872

59. Which of the following section of the Indian Evidence Act, 1872 has been amended by the Criminal Law (Amendment) Act, 2013?
A) Section 32 B) Section 55 C) Section 119 D) Section 124

60. Principle of 'omnia proesumuntur rite esse acta' is contained in:
A) Section 78 of Evidence Act B) Section 79 of Evidence Act
C) Section 80 of Evidence Act D) Section 81 of Evidence Act

61. An executive Magistrate is empowered to grant remand under Section 167, CrPC for a maximum period of
A) 15 days B) 7 days C) 60 days D) 90 days

62. For granting pardon under section 306 of the Code of Criminal Procedure, 1973
A) The witness must not be directly involved in the offence
B) The accused should have been given an opportunity to cross examine the person getting pardon
C) The person getting pardon need not be in police custody

D) The offence should not be punishable with imprisonment exceeding 10 years

63. _____ can proceed under section 340 of the Code of Criminal Procedure, 1973 and hold a preliminary enquiry.

I. Civil Court
II. Revenue Court
III. Criminal Court

A) I and II B) II and III C) III and I D) I, II and III

64. If the accused is convicted in a criminal case for an offence under the stature which does not provide for payment of compensation-

A) The Court cannot award compensation under section 357 of the CrPC and no civil proceedings are possible
B) The Court cannot award compensation under section 357 of the CrPC, but other civil remedies are possible
C) The Court can award compensation under section 357 of the CrPC, but the award will be taken into account in subsequent civil suits
D) The Court can award compensation under section 357 of the CrPC, but the award will not be taken into account in subsequent civil suits

65. Section 401 of the Code of Criminal Procedure, 1973

I. Allows the Court to convert finding of acquittal into conviction
II. Allows the Court to pardon the convict
III. Does not allow the Court to act suomotu
IV. Is only applicable to High Court

A) I and II B) II and IV C) II, III and IV D) I, II and III

66. What is normative jurisprudence?

A) The evaluation of the law on the basis of criteria for what constitutes good law
B) The study of legal norms
C) The theory that law normalises people
D) The study of what the law is

67. What is a rule according to H.L.A. Hart?

A) A Statement of an accepted standard of behaviour
B) An enforceable command
C) A moral standard
D) All of them

68. What is the place of Justice in Mill's Utilitarianism?

A) There is no place of justice in any utilitarian theory
B) Always, the social good always prevails and individual liberties are never absolute
C) Liberties are secure only insofar as they contribute to the sum total of social satisfaction
D) None of the Above

69. Can the principles of natural law vary in time?

A) Yes, the principles of natural law can change to accommodate technological/ideological/geopolitical changes (for example, the changing position of women, decolonisation, the rights of minority groups.
B) Yes, the principles of natural law theory can be deducted from a given legal system because they are regular occurrences in positive law. As such they change alongside the system in question.
C) No, they are immutable and eternal
D) All the above

70. The rule of recognition occupies a central position in Hart's legal positivism because

A) It helps us identify rules – rules are only rules if they are recognised as such
B) It tells us that if one person does not recognise the validity of a law it is not a law, making voluntary compliance the key element of law
C) It tells us what the basic source of legal authority is in a country
D) None of the above

71. What is Fuller's position in the Hart-Fuller debate?

A) That positivist criteria are insufficient to distinguish a system of law from a system of coercion
B) That the 'separation' theory (between law and morality) must be oppose
C) That law must refer to external moral standards
D) None of the above

72. Why is it said of Dworkin's work that it constitutes a third theory of law?

A) Because he agrees with legal positivism and natural law
B) Because he disagrees with legal positivism and natural law
C) Because he occupies a middle ground between legal positivism and natural law
D) All of the them

73. For Austin, laws properly so called include:

A) Constitutional and International law
B) Social rules such as queuing in line
C) Criminal law
D) All of them

74. Jural contradictories are:

A) A right held by A, correlated to a duty owed by B
B) A right held by A precluding B from having a right against A
C) Object of A's right
D) All of them

75. Sociological jurisprudence sees law as the product of a socially constructed reality. What does social construction mean?

A) An institutional invention by participants in a society

B) A fictitious interpretation of reality
C) A politically biased interpretation of reality
D) None of the above

76. What is the 'Lotus principle'?

A) The so-called *Lotus principle* is that *'restrictions upon the independence of States cannot therefore be presumed',* or, as it has been construed, 'whatever is not prohibited is permitted in international law'
B) The so-called Lotus principle is that States are free to choose the Court that they will submit their disputes
C) The so-called Lotus principle is that States are not prohibited to assert their enforcement jurisdiction on the high seas
D) The so-called Lotus principle is that customary law derives from the combination of State practice and opinion juris

77. What is a 'treaty' according to the Vienna Convention on the Law of Treaties (VCLT)?

A) Treaties are all agreements concluded between States, international organizations and non-State entities (e.g. corporations)
B) Treaties are agreements concluded between States in written form and governed by international law
C) Treaties are both the written and oral agreements between States
D) Treaties are agreements concluded between States in written form governed either by international or domestic law

78. Do third States enjoy any fishing rights within the Exclusive Economic Zone of another State?

A) When the coastal State cannot harvest the 'total allowable catch', the coastal State is to give other State access to that surplus with priority to be given to developing and land-locked States
B) Third States may never have access to fisheries within another State's EEZ
C) The coastal State is to give access to fisheries within its EEZ only to neighbouring States
D) Third States are free to fish within another EEZ, except from certain designated areas

79. What is the “Optional clause” in the ICJ Statute?

A) Optional clause is the clause in the ICJ Statute, which provides for the applicable law, according to the intention of the parties
B) Optional clause determines the intention of the parties to accept that the decision of the Court will be final and binding
C) Optional clause is the declaration deposited by a State, whereby it accepts the jurisdiction of the Court in respect of international legal disputes in relation to any other State accepting the same obligation
D) Optional clause is the clause that the parties deposit, which sets out the procedure of the written and oral pleadings

80. As per the Factories Act, 1948 "hazardous process" means any process or activity in relation to an industry specified in the first schedule where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would

A) Cause material impairment to the health of the persons engaged in or connected therewith
B) Result in the pollution of the general environment
C) Neither (A) nor (B)
D) Both (A) and (B)

81. As per the Factories Act, "_____", of a factory means the person who has ultimate control over the affairs of the factory.

A) Manager B) Owner C) Director D) Occupier

82. In which year was the Employees' State Insurance Act enacted?

A) 1948 B) 1976 C) 1923 D) 1961

83. Industrial employment standing orders act is applicable in every industrial establishment where ____ workmen are employed.

A) 200 B) 150 C) 100 D) 50

84. The Hindu Succession Act, 1956 abolishes

A) The doctrine of acquisition of right by birth
B) The doctrine of the right survivorship
C) Both (A) and (B)
D) None of these

85. Presumption that the younger survived the elder under Section 21 of the Hindu Succession Act, 1956 is a

A) Presumption of fact B) Presumption of fact and law
C) Rebuttable presumption of law D) Irrebuttable presumption of law

86. To mature as a ground of Divorce the 'Desertion', under the Hindu Marriage Act, 1955, must continue for a minimum period of

A) One year B) Two years C) Three years D) None of these

87. In which of its following Report the Law Commission recommended, the "Breakdown Principle' to be accepted as the additional ground of Divorce?

A) 70^{th} Report B) 71^{st} Report C) 72^{nd} Report D) None of these

88. If a Muta marriage is not consummated, the wife is entitled to

A) No dower B) One third dower C) Half dower D) Full dower

89. A and B of Srinagar entered into a contract on 1st September, 2006. Can they enforce the contract?

A) Yes, because they made the contract as per the provisions of Indian Contract Act, 1872
B) No, because Srinagar is not a part of India
C) No, because the Act does not extend to the State of Jammu and Kashmir
D) None of the above

90. A finder of goods
A) Has no responsibility for the goods
B) Is subject to the same responsibility as a bailee
C) Is the owner of the goods
D) None of the above

91. Ex turpi causa non oritur action means
A) From an illegal cause, no action arises
B) From an illegal cause action may arises
C) From an legal cause action may arises
D) From an legal cause action may not arises

92. A contracts with Indian Cricket Board to play for IPL-2 at south Africa. A falls ill and is advised by doctor to rest. The contract
A) Is Valid
B) Is void ab initio
C) Becomes void
D) Is voidable at A's option

93. A loud bass beat that can be heard through an apartment wall (from another apartment) at midnight can be
A) Conversion
B) Trespass
C) Interference with Contractual relations
D) Nuisance

94. What is meant by the term 'actionable per se'?
A) Actionable without proof of damage
B) Actionable at the instance of the injured party only
C) Actionable only in the civil courts
D) A tort of strict liability

95. Fill in the gap. Contributory negligence is _____ defense to a criminal charge.
A) Genuine B) Accurate C) Sharp D) No

96. Which of the following is not an essential element for a successful defence of *volenti non fit injuria*(voluntary assumption of risk)?
A) An express agreement between the parties
B) Knowledge by the claimant of the precise risk involved
C) Exercise of free choice by the claimant
D) A voluntary acceptance of the risk by the claimant

97. Corporate Identity Number (CIN), works as a unique identifier of a company for Indian Companies as well as foreign companies.

A) True B) False C) Can't say D) None of these

98. Under Section 149 of Companies Act, 2013 the minimum number of directors in the Private Company is

A) 7 B) 15 C) 3 D) 2

99. A public company does not have any restriction regarding the maximum number of members.

A) True B) False C) Can't say D) None of these

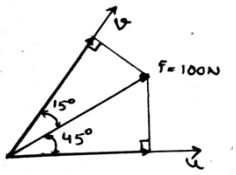
100. Only fully paid-up shares can be converted into stock.

A) True B) False C) Can't say D) None of these

x-x-x

M.E. Mechanical Engineering

1. Determine the magnitude of the projection of the vector force F = 100N, onto u axis, from the figure given below.



A) 96.6N
B) 60N
C) 100N
D) 70.7N

2. What is {(i.i) + (-i.j) + (-k.k) + (k.i)}.(Ai +Bj + Cz)?
A) 1 B) 0 C) A + B + C D) -1

3. Which of the following is correct in the determination of the moment direction by curling of wrist?
A) The thumb represents the direction of the force
B) The thumb represents the direction of the moment
C) The fingers represent the direction of the force
D) The direction in which you curl your wrist is towards the direction of the distance from point of contact of force to the axis of rotation.

4. The ultimate tensile strength of a material is 400 MPa and the elongation up to maximum load is 35%. If the material obeys power law of hardening, then the true stress-true strain relation (stress in MPa) in the plastic deformation range is:
A) $\sigma = 540\epsilon^{0.30}$ B) $\sigma = 775\epsilon^{0.30}$ C) $\sigma = 540\epsilon^{0.35}$ D) $\sigma = 775\epsilon^{0.35}$

5. The relationship between Young's modulus (E), Bulk modulus (K) and Poisson's ratio (μ) is given by:
A) $E = 3K(1-2\mu)$ B) $K = 3E(1-2\mu)$ C) $E = 3K(1-\mu)$ D) $K = 3E(1-\mu)$

6. An ejector mechanism consists of a helical compression spring having a spring constant of $K = 981 \times 10^3$ N/m. It is pre-compressed by 100 mm from its free state. If it is used to eject a mass of 100 kg held on it, the mass will move up through a distance of
A) 100mm B) 500mm C) 981 mm D) 1000mm

7. A solid uniform metal bar of diameter D and length L is hanging vertically from its upper end. The elongation of the bar due to self weight is:
A) Proportional to L and inversely proportional to D^2
B) Proportional to L2 and inversely proportional to D^2
C) Proportional of L but independent of D
D) Proportional of U but independent of D

8. If the value of Poisson's ratio is zero, then it means that
A) The material is perfectly plastic.

B) The material is rigid.
C) There is no longitudinal strain in the material
D) The longitudinal strain in the material is infinite.

9. A solid circular shaft of diameter 100 mm is subjected to an axial stress of 50MPa. It is further subjected to a torque of 10 kNm. The maximum principal stress experienced on the shaft is closest to

A) 41 MPa B) 82 MPa C) 164 MPa D) 204 MPa

10. The second moment of a circular area about the diameter is given by (D is the diameter)

A) $\frac{\pi D4}{4}$ B) $\frac{\pi D4}{16}$ C) $\frac{\pi D4}{32}$ D) $\frac{\pi D4}{64}$

11. The shapes of the bending moment diagram for a uniform cantilever beam carrying a uniformly distributed load over its length is:

A) A straight line B) A hyperbola C) An ellipse D) A parabola

12. A solid circular shaft of 60 mm diameter transmits a torque of 1600 N.m. The value of maximum shear stress developed is:

A) 37.72 MPa B) 47.72 MPa C) 57.72 MPa D) 67.72 MPa

13. A penstock pipe of 10m diameter carries water under a pressure head of 100 m. If the wall thickness is 9 mm, what is the tensile stress in the pipe wall in MPa?

A) 2725 B) 545.0 C) 272.5 D) 1090

14. The number degrees of freedom of a planar linkage with 8 links and 9 simple revolute joints is

A) 1 B) 2 C) 3 D) 4

15. The number of inversions for a slider crank mechanism is

A) 6 B) 5 C) 4 D) 3

16. The lengths of the links of a 4-bar linkage with revolute pairs only are p, q, r, and s units. Given that $p < q < r < s$. Which of these links should be the fixed one, for obtaining a "double crank" mechanism?

A) Link of length p B) link of length q C) Link of length r D) link of length s

17. 1) The degree of freedom for lower kinematic pairs is always equal to one.
2) A ball-and-socket joint has 3 degrees of freedom and is a higher kinematic pair
3) Oldham's coupling mechanism has two prismatic pairs and two revolute pairs.
Which of the statements given above is/are correct?

A) 1, 2 and 3 B) 1 only C) 2 and 3 D) 3 only

18. Maximum angular velocity of the connecting rod with a crank to connecting rod ratio 1: for a crank speed of 3000 rpm is around:

A) 300 rad/s B) 60 rad/s C) 30 rad/s D) 3000 rad/s

19. A fly wheel of moment of inertia 9.8 kgm^2 fluctuates by 30 rpm for a fluctuation in energy of 1936 Joules. The mean speed of the flywheel is (in rpm)

A) 600 B) 900 C) 968 D) 2940

20. For a certain engine having an average speed of 1200 rpm, a flywheel approximated as a solid disc, is required for keeping the fluctuation of speed within 2% about the average speed. The fluctuation of kinetic energy per cycle is found to be 2 kJ. What is the least possible mass of the flywheel if its diameter is not to exceed 1m?

A) 40 kg B) 51 kg C) 62 kg D) 73 kg

21. When a body slides down an inclined surface, inclined at an angle β, the acceleration 'a' of the body is given by

A) $a = g$ B) $a = g \sin\beta$ C) $a = g \cos\beta$ D) $a = g \tan\beta$

22. Longitudinal stress in a thin cylinder is

A) Equal to the hoop stress B) Twice the hoop stress

C) Half of the hoop stress D) One fourth of hoop stress

23. A boiler shell 200 cm diameter and plate thickness 1.5 cm is subjected to internal pressure of 1.5 MN/m, then the hoop stress will be

A) 30 MN/m^2 B) 50 MN/m^2 C) 100 MN/m^2 D) 200 MN/m^2

24. The type of threads used to transmit power in one direction only is

A) Acme B) Trapezoidal C) Buttress D) V thread

25. The Coefficient of fluctuation of energy of flywheel is given a

Where E_{max} = Maximum Kinetic energy of the Flywheel

E_{min} = Minimum Kinetic energy of the Flywheel

A) $(E_{max} - E_{min})$/Work done per cycle B) $(E_{max} + E_{min})$/Work done per cycle

C) $(E_{max} - E_{min})$ x Work done per cycle D) $(E_{max} + E_{min})$ x Work done per cycle

26. A fixed gear having 200 teeth is in mesh with another gear having 50 teeth. The two gears are connected by an arm. The number of turns made by the smaller gear for one revolution of arm about the centre of bigger gear is

A) 2 B) 4 C) 3 D) None of these

27. A metric thread of pitch 2mm and thread angle 60º is inspected for its pitch diameter using 3-wire method. The diameter of the best size wire in mm is

A) 0.86 B) 1.0 C) 1.15 D) 2.0

28. Two shafts A and B under pure torsion are of identical length and identical weight and are made of the same material. The shaft A is solid and the shaft B is hollow. We can say that

A) Shaft B is better than shaft A B) Shaft A is better than shaft B

C) Both the shafts are equally good D) None of the above

29. The maximum shear stress theory is used for

A) Brittle materials B) Ductile materials
C) Plastic materials D) Non-ferrous materials

30. Soderberg relation is based on _____ of the material whereas all other failure relation for dynamic loading are based on ultimate strength of the material
A) Elastic strength B) Yield strength C) Shear strength D) All of these

31. In grey cast iron, carbon is present in the form of
A) Cementite B) Free carbon C) Flakes D) Spheroids

32. Cyaniding is the process of
A) Dipping steel in cyanide bath
B) Reacting steel surface with cyanide salts
C) Adding carbon and nitrogen by heat treatment of steel to increase its surface hardness
D) Obtaining cyanide salts

33. Cupola produces following material
A) Cast iron B) Pig iron C) Wrought iron D) Malleable iron

34. As the shear angle increases, the plastic deformation of chip
A) Increases B) Decreases C) Remains same D) None of these

35. Cutting forces at the cutting tool can be measured by
A) A dynamometer B) A viscosity meter
C) A sine bar D) A combination set

36. The clearance angle is provided on the tools with a view to
A) Strength the tool
B) Shear off the metal
C) Facilitate easy flow of chips
D) Prevent the tool from rubbing on work piece

37. On a lathe machine, the spindle speed is lowest during
A) Taper turning B) Threading C) Parting off D) Knurling

38. In oxidizing flame, the inner core attains a temperature of …….. °C
A) 2100 B) 2800 C) 3150 D) 3500

39. Plastic bottles are manufactured using the process of
A) Blow moulding B) Injection moulding
C) Atomizing D) Die casting

40. Using the Taylor equation $VT^n = c$, calculate the percentage increase in tool life when the cutting speed is reduced by 50% (n = 0.5 and c = 400)
A) 300 B) 400% C) 100% D) 50%

41. In a rolling process, the state of stress of the material undergoing deformation is

A) Pure compression B) Pure shear
C) Compression and shear D) Tension and shear

42. The process that improves the machinability of steels, but lowers the hardness and tensile strength is

A) Normalizing B) Annealing C) Tempering D) Hardening

43. If δQ is the heat transferred to the system and δW is the work done by the system, then which of the following is an exact differential

A) δQ B) δW C) δQ + δW D) δQ – δW

44. A pitot tube measures:

A) Static pressure
B) Dynamic pressure
C) Total pressure
D) Difference between total and dynamic pressure

45. The inlet value of a four stroke cycle I.C engine remains open for nearly

A) 180° B) 125° C) 235° D) 200°

46. Which instrument is used for surface roughness measurement

A) Clinometer B) Auto-collimeter C) Optical square D) Profilometer

47. The meaning of 'Payoffs' in Game Theory is

A) Outcome of a game when different alternatives are adopted by players
B) No. of players involved in a game
C) Value of a game
D) Strategies used by players

48. The North West Corner rule

A) Is used to find an initial feasible solution
B) Is used to find an optimal solution
C) Is based on the concept of minimizing opportunity cost
D) None of these

49. In a process chart, the square symbol represents

A) Transport B) Inspection D) Action D) Delay

50. A negative loop in the P.V diagram of an I.C engine is due to

A) Pre ignition in the engine B) Suction of air for engine
C) Pre opening of the exhaust valve D) High pressure in the cylinder

51. A 1 ton capacity water cooler cools water steadily from 35°C to 20°C. The specific heat of water is 4.18 KJ/kg-K. The water flow rate will be nearly.

A) 13.33 litre/hr B) 33.3 litre/hr C) 200 litre/hr D) 250 litre/hr

52. Which of the following is a non positive displacement type of compressor

A) Reciprocating compressor B) Centrifugal compressor
C) Root blower D) Vane type compressor

53. The maximum possible draft in cold rolling of sheet increases with the

A) Increase in coefficient of friction B) Decrease in coefficient of friction
C) Decrease in roll radius D) Increase in roll velocity

54. Streamlines, path lines and streak lines are virtually identical for

A) Uniform flow B) Flow for ideal fluids
C) Steady flow D) Non uniform flow

55. Eutectic reaction for iron- carbon system occurs at

A) $600\ ^0$C B) 723^0C C) 1147^0C D) 1490^0C

56. The crystal structure of α iron is

A) Simple Cubic B) Face centered cubic
C) Body centered cubic D) Close packed hexagonal

57. To show the internal parts of machine components, the section lines are drawn at angle of

A) 45^0 B) 0^0 C) 60^0 D) 90^0

58. Which of the following statements are FALSE about the buoyancy of an object

A) The force of buoyancy on a ship is equal to the weight of the water displaced by the ship and its cargo.
B) Buoyancy explains why it is easier to lift an object in water than it is in air.
C) An object only has buoyancy in air.
D) An object only has buoyancy in liquids.

59. Cavitations in centrifugal pumps can be reduced by

A) Reducing the discharge B) Reducing the suction head
C) Throttling the discharge D) Increasing the flow velocity

60. The Weber number in dimensionless system is expressed as

A) $\frac{V}{\sqrt{\sigma/\rho L}}$ B) $\frac{V}{\sigma\sqrt{\rho L}}$ C) $\frac{\sigma V}{\sqrt{\rho L}}$ D) $\frac{\sqrt{\sigma/\rho L}}{V}$,

Where σ is surface tension per unit length.

61. The heat is absorbed by

A) Condenser B) Evaporator C) Compressor D) Thermostat

62. Work study includes

A) Method study B) Motion study C) Time study D) All of these

63. At breakeven point

A) Fixed costs are recovered B) Variable costs are recovered

C) Total costs are recovered D) Some costs are recovered

64. The word kanban is most appropriately associated with
A) Economic order quantity B) Just–in–time production
C) Capacity planning D) Product design

65. A linear programming problem is shown below:

Maximize $3x + 7y$

Subject to

$3x + 7y \leq 10$

$4x + 6y \leq 8$

$x, y \geq 0$

It has

A) An unbounded objective function
B) Exactly one optimal solution
C) Exactly two optimal solutions
D) Infinitely many optimal solutions

66. The following is used to check the diameters of holes
A) Plug gauge
B) Ring gauge
C) Slip gauge
D) Standard screw pitch gauge

67. Which quality management program is related to the maintenance of plants and equipments
A) Environmental management systems B) Fault tree analysis
C) Failure mode effect analysis D) Total productive maintenance

68. Which of the following is true for interference fit
A) Shaft is always smaller than the hole
B) Shaft is always bigger than the hole
C) Interference fits have shaft and hole of same dimension
D) None of the above

69. Which of the following is not a rule of network construction
A) Each defined activity is represented by one and only one arrow
B) A network should have only initial and one terminal node
C) Identical initial and final nodes can identify two activities
D) Only as few dummy activities should be included as is warranted.

70. Calculate the power required for machining of a workpiece on lathe having efficiency of 85% on full load, when tangential force required is 1200 N and cutting speed 195 m/min
A) 4.59 Kw B) 275.29 W C) 3.315 kW D) 8.145kW

71. Investment casting is used for

A) Shapes which are made by difficulty using complex patterns in sand casting
B) Mass production
C) Shapes which are very complex and intricate and can't be cast by any other method
D) There is nothing like investment casting

72. In which of the following methods, an electrolyte is used?

A) Ultrasonic Machining B) Electrochemical Machining
C) Abrasive Jet Machining D) Laser Beam Machining

73. In Ultrasonic machining, the material is removed by

A) Anodic dissolution B) Thermal melting
C) Abrasive action D) Electrochemical oxidation

74. The values of enthalpy of steam at the inlet and outlet of a steam turbine in a Rankine cycle are 2800kJ/kg and 1800kJ/kg respectively. Neglecting pump work, the specific steam consumption in kg/kW-hour is

A) 3.60 B) 0.36 C) 0.06 D) 0.01

75. The ratios of the laminar hydrodynamic boundary layer thickness to thermal boundary layer thickness of flows of two fluids P and Q on a flat plate are ½ and 2 respectively. The Reynolds number based on the plate length for both the flows is 10^4. The Prandtl and Nusselt numbers for P are 1/8 and 35 respectively. The Prandtl and Nusselt numbers for Q are respectively

A) 8 and 140 B) 8 and 70 C) 4 and 70 D) 4 and 35

x-x-x

M.A. (Economics)

1. If demand is linear (a straight line), then price elasticity of demand is
A) Elastic in the upper portion and inelastic in the lower portion
B) Inelastic in the upper portion and elastic in the lower portion
C) Inelastic throughout
D) Elastic throughout

2. In long-run equilibrium in a competitive market, firms are operating at
A) The minimum of their average-total-cost curves
B) Zero economic profit
C) The intersection of marginal cost and marginal revenue
D) All of these answers are correct

3. Which of the following is a characteristic of capital as a factor of production?
A) It never depreciates B) It is fixed in supply
C) It is an active factor of production D) It is a passive factor of production

4. On which law of consumption the concept of consumer's surplus is based?
A) Engel's law B) Law of demand
C) First law of Gossen D) Second law of Gossen

5. For the function $Q = AK^aL^b$ the following statements are given:
1) $dQ/dL = AbK^aL^{b-1}$
2) Marginal Product of Labour (MPL) = $AaK^{a-1}L^b$
3) Marginal Product of Capital (MPK) = $a\times(Q / K)$
4) Marginal rate of substitution of capital for labour (MRS) = $|dK / dL|$

Which of the above statements are true?
A) 1,2,3 B) 1,2,3,4 C) 2,3,4 D) 1,3,4

6. For the demand function $Q_1 = 10 - 9\ P_1 + P_2 + 0.01Y$ which one of the following statements is true?
A) $dQ_1 / dP_1 = -9 + P_2 + 0.01Y$ B) $dQ_1 / dP_1 = -9$
C) $dQ_1 / dP_2 = P_2$ D) $dQ_1 / dY = 0.01 - 9\ P_1 + P_2$

7. In which of the following market structure is the degree of control over the price of its product by a firm very large?
A) Imperfect competition B) Perfect competition
C) Monopoly D) In A and B both

8. The producer's demand for a factor of production is governed by the ___ of that factor.

A) Price B) Marginal Productivity
C) Availability D) Profitability

9. Under conditions of perfect competition in the product market:
A) MRP=VMP B) MRP > VMP C) VMP > MRP D) None of these

10. Who has sought to measure Consumer's Surplus with the help of indifference curve technique?
A) Alfred Marshall B) Edgeworth C) J.R. Hick D)Pareto

11. Which of the following measure of the high-power money supply (H) has been used by RBI of India
A) Currency held by the public + Other deposits with the RBI
B) Cash reserves of the commercial banks + Other deposits with the RBI
C) Currency held by the public + cash reserves of the commercial banks + other deposits with the RBI
D) Currency held by the public + cash reserves of the commercial banks + Time deposits of the commercial banks + other deposits with the RBI

12. Which of the following is known as long run average cost curve?
A) Learning curve B) Envelope curve
C) Equal product curve D) Phillips curve

13. Who has contributed the modem theory of interest rate determination?
A) Paul A. Samuelson B) Gunnar Myrdal
C) Knut Wicksell D) J.R. Hicks

14. Which one of the following is NOT correct?
A) During inflation lenders suffer and borrowers benefit out'
B) Rising inflation indicates rising aggregate demand and indicates comparatively lower supply and higher purchasing capacity among the consumers'
C) With rising inflation the currency of the economy depreciates provided it follows the flexible currency regime.
D) Inflation decreases the nominal (face) value of the wages while the real value increases.

15. _____unemployment may result when some workers are temporarily out of work while changing job
A) Seasonal B) Frictional C) Disguised D) Technical

16. An expression coined by economists to describe an economy that is growing at such a slow pace that more jobs are being lost than are being added:
A) Stagflation B) Recession
C) Growth Recession D) Ratchet Inflation

17. When national income is calculated with reference to a base year, it is called:
A) Nominal national income B) Net national income
C) Real national income D) Gross national income

18. What is the correct formula for GDP Deflator?
A) Nominal GDP - (minus) Real GDP B) Nominal GDP + Real GDP
C) Nominal GDP/ Real GDP D) Real GDP/ Nominal GDP

19. According to the Classical model, unemployment
A) Could not persist because wages would fall to eliminate the excess supply of labour
B) Could persist for long periods of time because wages are not flexible
C) Could be eliminated only through government intervention
D) Could never exist

20. Which country was the first to adopt a gold standard in the modern sense?
A) Italy B) France C) Great Britain D) Portugal

21. Under the Industrial policy of 1991:
A) The mandatory convertible clause is applicable to all term loans.
B) The mandatory convertible clause is applicable to term loans of more than 10 years.
C) The mandatory convertible clause is applicable to term loans of less than 10 years.
D) The mandatory convertible clause is no longer applicable.

22. Pointing to a woman in the picture, Rajesh said her mother has only one grandchild whose mother is my wife. How is the woman in the picture related to Rajesh?
A) Daughter B) Niece C) Wife D) Sister-in-law

23. Which of the following diagrams indicates the best relation between Women, Mothers and Engineers?

A) 

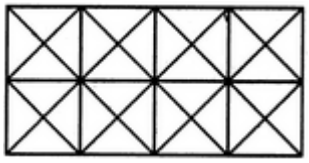
B) 

C) 

D) 

24. Rasik walked 20 m towards north. Then he turned right and walks 30 m. Then he turns right and walks 35 m. Then he turns left and walks 15 m. Finally he turns left and walks 15 m. In which direction and how many metres is he from the starting position?
A) 15 m West B) 30 m East C) 30 m West D) 45 m East

25. Count the number of squares in the given figure.



A) 11 B) 21 C) 24 D) 26

26. The price of the cooking oil has increased by 25 %. The percentage of reduction that a family should affect in the use of cooking oil so as not to increase the expenditure on this account is:

A) 15% B) 20% C) 25 % D) 30%

27. Which is following indicator is not considered while calculating Human Development Index by UNDP?

A) Life expectancy B) Educational attainment
C) Standard of living D) Infant mortality

28. Arrange the various stages in chronological order given by Rostow stages of economic growth

I. Age of high mass consumption
II. Preconditions of take off stage
III. Take off stage
IV. Drive to maturity

A) ii),iii),iv),i) B) ii),iv),iii),i) C) iv),iii),ii),i) D) ii),iii),i),iv)

29. Rosenstein Rodan justified the theory of "big push" with the help indivisibilities not included:

A) Indivisibility of production function B) Indivisibility of demand
C) Indivisibility of supply of investment D) Indivisibility of supply of savings

30. Quote " A country is poor because it is poor " given by

A) Nelson B) Lewis C) Keynes D) Nurkse

31. Pioneer among the economists who advocates the concept of rolling plan

A) Gunnar Myrdal B) Amartya Kumar Sen
C) Manmohan singh D) Musgrave

32. Present stage of India with respect to theory of demographic transition is:

A) First B) Second C) Third D) Fourth

33. The economist who propounded the concept of technical dualism was:

A) Prof Boeke B) Prof Higgins C) Prof Hirschman D) Prof mint

34. Which of following investment criterion has been advocated Amartya Sen:
A) Employment criterion
B) Reinvestment criterion
C) Capital turnover criterion
D) Time factor criterion

35. Which of following Economist was optimistic regarding stability/future of capitalism?
A) Keynes B) Schumpeter C) Karl Marx D) None of these

36. India's second five year plan was based on:
A) Leontiff input output model
B) Harrod domar model
C) Mahalnobis two sector model
D) Mahalnobis four sector model

37. Sum of the square of residual is used as a measure of:
A) Explained Variance
B) Unexplained Variance
C) Disturbance term
D) Explained Sum of Square

38. The least square and Maximum Likelihood method produce same estimators in case of
A) Linear Model
B) Quadratic Model
C) Polynomial of degree *n*
D) Any non-linear model

39. Which test of autocorrelation is applicable in case of dynamic model?
A) Durbin Watson test
B) Durbin's *h-test*
C) Durbin-Wu-Hildreth test
D) Haussmann test

40. Which one of the following is a test of Heteroscedasticity?
A) Breusch-Pagan test
B) Frisch Confluence Analysis
C) Durbin Watson test
D) Wald test

41. The use of a linear modelat the place of non-linear model is called
A) White noise error
B) Standard Error
C) Specification Error
D) Mean Square Error

42. The regression line for a bivariate model passes through
A) Meadians of two axes
B) Arithmetic means of two axes
C) Geometric means of two axes
D) Modes of two axes

43. The presence of perfect multicollinearity causes
A) Increase in magnitude of coefficients
B) Fall in magnitude of coefficients
C) Indeterminacy of coefficients
D) Infinite Coefficients

44. The R^2 is not a measure of _____ out of the following
A) Coefficient of Multiple determinant
B) Ratio of explained variation to total variation in dependent variable because of independent variable
C) Measure of goodness of fit of the model
D) Standard Error

45. What is the degree of freedom for a *t-statistics* to test significance of each coefficient in a regression model with one dependent variable and two independent variables?

A) *n-3* B) *n-1* C) *n-2* D) *n-4*

46. Which one of the following is a value of *F-statistics* if $R^2=0.85$, $n=36$, $k=4$?

A) 50.56 B) 60.44 C) 6.44 D) 5.56

47. A line that traces relationship between rate of return on bonds of different majorities?

A) Marginal Line B) Profit indifference

C) Coupling of rates D) Yield Curve

48. The 'Quantitative Theory of Money' is associated with _____function of money

A) Store of value B) Unit of account

C) Medium of exchange D) None of these

49. "Money is what Money does" was given by

A) Crowther B) Robertson C) Walker D) Marshall

50. In case of floating exchange rate, a surplus on BOP will cause_____

A) Exchange rate to appreciate B) Government intervention in currency market

C) No change in exchange rate D) Exchange rate to depreciate

51. Use the information on Output per labour hour in table below

	Country – A	Country – B
Mobile	3	9
Rice	1	2

The Country-B has comparative advantage in

A) Rice B) Mobile C) Both Products D) Neither Products

52. Suppose A is 5×2 matrix, B is r × s matrix and C is p×3 matrix. If $A^T \times B \times C^T$ is defined which of the following is true

A) r=2, s=5 B) r=3, s=4 C) r=5, s=3 D) r=3, s=5

53. Which value of 'a' will make the following matrix A singular?

$$A=\begin{pmatrix} a & -1 & -3 \\ 3 & 2 & 3 \\ 2 & 1 & 2 \end{pmatrix}$$

A) -3 B) -2 C) 3 D) 2

54. A firm faces the following long run cost function

$$TC= q^3-20q^2+300q$$

The average cost function will be at its minimum when

A) q=10, AC=250 B) q=20, AC=150 C) q=10, AC=200 D) q=20, AC=150

55. In the rule of addition of probability, the events are always

A) Independent events
B) Mutually exclusive events
C) Bayesian
D) Empirical

56. If for a distribution the difference of first quartile and median is greater then difference of median and third quartile, then the distribution is classified as
A) Absolute open ended
B) Positive skewed
C) Negative skewed
D) Not skewed at all

57. Which of the following statements about mean (μ) and variance (σ) of Binomial distribution is not true?

A) $\mu = 5.00, \ \sigma^2 = 2.50$
B) $\mu = 6.00, \ \sigma^2 = 4.20$
C) $\mu = 3.75, \ \sigma^2 = 2.81$
D) $\mu = 4.00, \ \sigma^2 = 9.00$

58. In multiplicative theorem the $P(A \cap B) = P(A) \times P(B)$ is applicable if
A) Events are mutually exclusive
B) Events are dependent
C) If events are exhaustive
D) If events are independent

59. The variable is random if
A) It assumes a probability distribution
B) It is exogenously given with probability distribution
C) Some items of variable are missing
D) None of above

60. Mean and Variance of which distribution is same
A) Bernoulli distribution
B) Binomial distribution
C) Normal distribution
D) Poisson Distribution

61. Given the demand curve perfectly elastic and supply curve unitary elastic, tax burden falls
A) Entirely on seller
B) Equally on seller and buyer
C) Entirely on buyer
D) More on buyer than seller

62. Which of the following schemes were announced in Interim Budget 2019-20?
i. PM KISAN
ii. AYUSHMAN BHARAT
iii. GOBAR DHAN
iv. PRADHAN MANTRI SHRAM YOGI MAANDHAN

A) i and iv
B) i, iii and iv
C) ii and iii
D) i only

63. Canons of Public Expenditure are given by
A) Adam Smith
B) Dalton
C) Findley Shirras
D) Pigou

64. Effective Revenue Deficit target set by the interim budget 2019-20
A) 0.2%
B) 1.3%
C) 2.2%
D) 3.4%

65. As per the 7th Schedule of Indian Constitution which of the following taxes is included in Union list
i. Income tax except agricultural income

ii. Tax on Agricultural income
iii. Rates on stamp duty on financial documents
iv. Tax on consumption and sale of electricity

A) i, iii, iv B) iii,iv C) i, iii D) i, iv

66. Weber theory in industrial economics deals with
A) Industrial Location B) Industry performance
C) SCP Paradigm D) Industrial Conduct

67. Technical Efficiency is a_____
A) Cross-sectional concept B) Dynamic concept
C) Long-run concept D) Medium term concept

68. What is the current base year of IIP?
A) 2004-05 B) 2007-08 C) 2011-12 D) 2017-18

69. The term Green revolution coined by
A) M S Swaminathan B) Sam Pitroda
C) Norman Borlaug D) William Gaud

70. As per Tendulkar committee estimates, people below poverty line in 2011-12 w.r.t. India
A) 12 % B) 29.5% C) 21.9 % D) 25.5 %

71. Who decides MSP in India for food grains?
A) NSSO B) Ministry of Finance
C) DIPAM D) CACP

72. Which of the following index is not given by World Bank?
A) Inclusive Development Index B) Human Capital Index
C) Ease of doing business D) Logistic Performance Index

73. External debt of India as a percentage of GDP is approximately
A) 20% B) 15% C) 25% D) 10%

74. The major export partner of India in recent years is
A) China B) Bangladesh C) USA D) Nepal

75. How many corporations are there in the present list of Maharatna
A) 10 B) 7 C) 8 D) 9

x-x-x

M.A. (Social Work)

1. The leader whose birthday is celebrated as Teacher's Day is-

A) Mahatma Gandhi B) Dr. Rajendra Prasad
C) Maulana Azad D) Dr. Radha Krishnan

2. Who became the first Minister of Education in the Indian Government-

A) Dr. S.L.Shrimali B) Shri Humayun Kabir
C) Maulana Abul Kalam Azad D) Shri M.C.Chagla

3. Which party did former US President Barak Obama belong to-

A) Democratic Party B) Republican Party
C) Conservative Party D) Labour Party

4. A society that experiences little or no change from one generation to the next is referred to as-

A) Closed society B) Static society C) Open society D) Dead society

5. Which of the following is not an essential feature of a Community-

A) Population B) Locality C) We-feeling D) Smallness in size

6. An organisation deliberately formed for the collective pursuit of some interests which its members share, is known as-

A) Institution B) Association C) Secondary Group D) Community

7. Which of the following is not an essential feature of an association-

A) A group of people B) Common sentiments
C) Rules and procedures D) Common purposes

8. The process by which individuals and groups are ranked in a more or less enduring hierarchy of status is known as-

A) Stratification B) Ramification C) Mobilization D) Sanskritization

9. Which of the following features are typical of genuine agrarian societies-

A) Farming and Herding B) Village community system
C) Minimal division of labour D) Great role of family

10. A system of exchange common to both the primitive and modern societies is the system of-

A) Barter B) Gifts C) Credit D) Monetary

11. The number of persons per square kilometre is defined as –

A) Population Density B) Population Concentration
C) Population Growth D) Population Index

12. The death of children below one year of life is known as-

A) Child mortality B) Intra-Uterine mortality
C) Neo-natal mortality D) Infant mortality

13. Largest Slum population was registered in-

A) Maharashtra B) Kerala C) Delhi D) Kolkata

14. What is considered to be a crucial aspect of any social movement-

A) Class consciousness B) Ideology

C) Economic structure D) Religion

15. The revolt in Telangana was launched by-

A) The Communist Party of India B) The Indian National Congress

C) The Bharatiya Janta Party D) All India Kisan Sabha

16. The notion that men are stronger than women is a-

A) Belief B) Norm C) Value D) Sanction

17. The_____ is a form of institutionalized crowd-

A) Aggregate B) Public C) Mob D)Audience

18. An acting crowd that is aggressive or destructive is often called a/an-

A) Public B) Audience C) Mob D) Expressive crowd

19. Whenever the individuals live together in such a way that they share the basic conditions of a common life, we call them forming a/an-

A) Society B) Community C) Association D) Group

20. Which of the following is not an institution-

A) Marriage B) Theatre C) Religion D) Property

21. Political system, religious system, educational system or economic system are-

A) Functions of social system B) Types of social system

C) Elements of social system D) Sub-systems of social system

22. Direct socialization begins only after-

A) Birth B) Childhood C) Adolescence D) Adulthood

23. The words 'Satyameva Jayate' inscribed below the base plate of the emblem of India are taken from-

A) Rigveda B) Satpath Brahmana

C) Mundak Upanishad D) Ramayana

24. *Purusha Sukta* is a part of-

A) Rigveda B) Yoga-sutra C) Ramayana D) Bhagvadgita

25. Which of the following places was famous as a seat of Mahayana learning-

A) Nalanda B) Taxila C) Varanasi D) Sarnath

26. Which one among the following monument(s) was earlier known as 'All India War Memorial'-

A) Gateway of India B) India Gate C) Charminar D) Lal Quila

27. World Trade Organisation was established in-
A) 1993 B) 1994 C) 1995 D) 1996

28. International Court of Justice is in-
A) Geneva B) The Hague C) Chicago D) Switzerland

29. According to United Nations Convention on Child Rights, which of the following is not a right-
A) Social Protection B) Employment
C) Protection from Exploitation D) Education

30. The first Prime Minister of India in 1947 was appointed by-
A) The Governor General
B) The President of India
C) Mahatma Gandhi
D) Dr. Rajendra Prasad as Chairman of the Committee

31. India is a Democratic Republic because-
A) There is Independence of judiciary
B) The head of the State is elected by the people
C) There is parliamentary supremacy
D) There is distribution of power between Centre and State

32. Who is the highest law officer of the State-
A) Attorney General B) Solicitor General
C) Advocate General D) Secretary General Law Department

33. Which State Government has launched a 'Happiness Curriculum' for School Students-
A) Delhi B) Kerala C) Maharashtra D) Karnataka

34. Which journalist was elected as the new President of Delhi and Districts Cricket Association-
A) Deepak Chaurasia B) Rajat Sharma
C) Ravish Kumar D) Pankaj Pachauri

35. Which State granted Religious Minority status to the Jews-
A) Maharashtra Government B) Kerala Government
C) Gujarat Government D) Karnataka Government

36. IPS Officer Sundari Nanda has become the first woman DGP of which Union territory-
A) Puducherry B) Daman and Diu C) Chandigarh D) Lakshadweep

37. The term 'Mental Retardation' has been replaced by which term-
A) Developmental Retardation B) Intellectual Disability

C) Mental Disorder D) Neuro-Disorder

38. The formula for calculating IQ is-
A) MA/CAx100 B) MA/CAx200 C) CA/MAx100 D) CA/MAx200

39. Which of the films is based on the life of a deaf- blind person, an adaptation of Helen Keller's 'The Story of my Life'-
A) Khamoshi B) Koshish C) U, Me Aur Hum D) Black

40. Which disability did the child 'Ishaan' have in the movie 'Taare Zameen Par'-
A) Dyslexia B) Alzheimer Disease
C) Autism D) Cerebral Palsy

41. 'Kindergarten' system of education was introduced by-
A) Friedrich Froebel B) T.P. Nunn C) Maria Montessori D) Herbert Spencer

42. RTE Act 2009 was enacted on-
A) 12th April 2009 B) 4th August 2009
C) 15th September 2009 D) 28th December 2009

43. The RTE Act 2009 has been extended to whole of India except_____ State-
A) Tamil Nadu B) Arunachal Pradesh
C) Jammu and Kashmir D) Telengana

44. According to RTE Act 2009 children of which age group will be provided free and compulsory education-
A) 7 to 14 years B) 4 to 14 years C) 6 to 14 years D) 3 to 10 years

45. As per RPWD Act 2016, how many seats are reserved in government institutions of higher education-
A) 3% B) 4% C) 5% D) 2%

46. Persons with benchmark disabilities are those with at least_____ of any of the specified disabilities under RPWD Act 2016-
A) 40% B) 50% C) 30% D) 42%

47. According to RPWD Act 2016 the number of recognised disabilities have increased from-
A) 7 to 9 B) 9 to 21 C) 9 to 18 D) 7 to 21

48. RPWD Act 2016 came into effect on-
A) 1 January 2016 B) 9 April 2016
C) 15 August 2016 D) 28 December 2016

49. Albert Einstein was suffering from-
A) Traumatic brain injury B) Dyslexia
C) Deafness D) Mental disorder

50. Stephen Hawkins was suffering from-

A) Asperger Syndrome B) Dyslexia
C) Dyscalculia D) Amyotrophic Lateral Sclerosis

51. Who said "Disability need not be an obstacle to success"-

A) Albert Einstein B) Tiger Woods
C) Stephen Hawkins D) Franklin D. Roosevelt

52. Sex, Age and Caste all are examples of-

A) Achieved status B) Ascribed status C) Pre-set status D) Status image

53. The caste system is a-

A) Social institution B) Religious institution
C) Economic institution D) Political institution

54. Differences in age of first walking or talking between children living in the same sort of environment are primarily due to differences in-

A) Imitative learning B) Experiential learning
C) Observational learning D) Rate of motivation

55. World Wetlands Day is celebrated on-

A) January 5th B) February 2nd C) March 6th D) April 1st

56. World Earth Day falls on-

A) March 23rd B) April 22nd C) May 3rd D) June 9th

57. World Population Day falls on-

A) January 10 B) May 14 C) July 11 D) August 17

58. India placed 'Mangalyaan' in Mars Orbit on-

A) August 15,2013 B) September 24, 2014
C) January 26, 2018 D) February 13, 2015

59. World Wild-Life Week is celebrated from-

A) April 8-14 B) May 20-26 C) June 10-16 D) October 1-7

60. Who is the father of Indian Renaissance-

A) Raja Ram Mohan Roy B) David Hare
C) Ishwar Chander Vidhyasagar D) Rabinder Nath Tagore

61. Universal Declaration of Human Rights was adopted on-

A) February 24, 1940 B) November 3, 1945
C) December 10, 1948 D) January 5, 1949

62. Which of the following is not the chief organ of the United Nation Organisation-

A) International Labour Organization B) Security council
C) International court of Justice D) General Assembly

63. Permanent Secretariat to coordinate the implementation of SAARC programme is located at-

A) Dhaka B) New Delhi C) Colombo D) Kathmandu

64. Which of the following Commission was appointed by the Central Government on Union State Relations in 1983-

A) Sarkaria Commission B) Dutt Commission
C) Setalvad Commission D) Rajamannar Commission

65. Which of the following tax is levied and collected by the Union Government but the proceeds are distributed between the Union and States-

A) Sales Tax B) Income Tax C) Estate Duty D) Land Revenue

66. Which of the following describes India as a Secular State-

A) Fundamental Rights B) Directive Principles of State Policy
C) Fifth Schedule D) Preamble of the Constitution

67. Members of the Election Commission are appointed by-

A) President of India B) Prime Minister of India
C) Chief Justice of India D) Elected by the People

68. Which of the following is Doordarshan's Educational Television-

A) Gurukul B) Gyan Bharti C) Gyan Darshan D) Vidya

69. How can forgetting be minimised-

A) Cramming B) Discrimination C) Over learning D) Recitation

70. Which of the following are the characteristics of a person with scientific attitude-

A) Adventure B) Brevity C) Sharp Memory D) Objectivity

71. _____ is the apex institution involved in the planned and coordinated development of teacher education system in the country-

A) UGC B) NCERT C) NCTE D) NUPA

72. The famous 'Hornbill festival' is celebrated in which of the following states-

A) Nagaland B) Mizoram C) Assam D) Meghalaya

73. In which year first census was conducted in India-

A) 1884 B) 1872 C) 1881 D) 1856

74. The first Indian woman to preside a session of Indian National Congress was_____

A) Rajkumari Amrit Kaur B) Vijaya Lakshmi Pandit
C) Aruna Asaf Ali D) Sarojini Naidu

75. The system of competitive examination for civil service was accepted in principle in the year-

A) 1833 B) 1853 C) 1858 D) 1882

x-x-x