Mathematics(Ph.D.)

1. The interval in which the graph of the curve $y = (x+1)^{\frac{1}{3}}$ is concave upward

   (A) $(-\infty, -1)$ (B) $(-1, \infty)$ (C) $(-\infty, \infty)$ (D) $(1, \infty)$

2. Let $f'(x) = \dfrac{1}{3 - x^2}$ and $f(0) = 1$. Then the interval in which $f(1)$ lies is

   (A) $\left[-\dfrac{3}{2}, \dfrac{3}{2}\right]$ (B) $\left[\dfrac{4}{3}, \dfrac{3}{2}\right]$ (C) $\left[-\dfrac{4}{3}, \dfrac{3}{2}\right]$ (D) $\left[-\dfrac{3}{2}, \dfrac{4}{3}\right]$

3. The function $f(x, y) = \begin{cases} (x+y)\sin\left(\dfrac{1}{x+y}\right), & x+y \neq 0, \\ 0, & x+y = 0. \end{cases}$ is

   (A) Continuous at $(0,0)$ and its partial derivative f_x exists at $(0,0)$

   (B) Continuous at $(0,0)$ but its partial derivatives f_x and f_y do not exist at $(0,0)$

   (C) Continuous at $(0,0)$ and its partial derivative f_y exists at $(0,0)$

   (D) Continuous at $(0,0)$ and both partial derivatives f_x and f_y exist at $(0,0)$

4. The area of the region enclosed between the curves $y = \sqrt{x}$ and $y = x^2$ is

   (A) $-\dfrac{1}{2}$ (B) $\dfrac{3}{2}$ (C) $\dfrac{1}{2}$ (D) $\dfrac{1}{3}$

5. Sequence of real numbers is a Cauchy sequence if and only if:

   (A) It is a convergent but not bounded   (B) It is convergent

   (C) It is positive term sequence   (D) It is bounded

6. If f is Riemann integrable with respect to α on $[a, b]$, then

   (A) f is increasing and α is bounded function

   (B) f is bounded and α is increasing function

   (C) f and α both bounded function

   (D) f and α both increasing function

7. The geometric series: $1 + x + x^2 + - - - + x^{n-1} + - - -\infty$ converges uniformly in the interval

(A) $(-1, 1)$ 　　　　 (B) $\left(-\dfrac{1}{2}, \dfrac{1}{2}\right)$ 　　　　 (C) $(0, 1)$ 　　　　 (D) $\left(-\dfrac{1}{2}, 1\right)$

8. If G is a simple connected 3-regular planar graph where every face is bounded by exactly 3 edges, then the size of G is

(A) 3 　　　　 (B) 4 　　　　 (C) 6 　　　　 (D) 5

9. If G is a connected plane graph of order v, size e and with f faces, then

(A) $v - e + f = 2$ 　　 (B) $e - v + f = 2$ 　　 (C) $v + e - f = 2$ 　　 (D) $v + e + f = 2$

10. The number of trailing zeros in $101!$ are

(A) 12 　　　　 (B) 16 　　　　 (C) 18 　　　　 (D) 24

11. If z_1, z_2, z_3 be the vertices of an equilateral triangle, then $z_1^2 + z_2^2 + z_3^2$ is equal to

(A) 0 　　　　 (B) $z_1 + z_2 + z_3$ (C) $z_1 z_2 + z_2 z_3 + z_3 z_1$ (D) $z_1 z_2 z_3$

12. The region described by $\left\{ z : 0 \le Arg(z) \le \dfrac{\pi}{4} \right\}$ is

(A) Open

(B) Connected and bounded

(C) Open and bounded

(D) Not open, connected and unbounded

13. The function $w = Ln\ z$ is analytic for all z except when

(A) $\mathrm{Re}(z) \le 0$ 　　 (B) $\mathrm{Re}(z) \ge 0$ 　　 (C) $\mathrm{Im}(z) \le 0$ 　　 (D) $\mathrm{Im}(z) \ge 0$

14. The image of the line $\mathrm{Im}(z) = 1$ under the mapping $w = z^2$ is

(A) a straight line 　　 (B) parabola 　　 (C) hyperbola 　　 (D) ellipse

15. The sum of the residue of $f(z) = \dfrac{\sin z}{z \cos z}$ at its poles inside the circle $|z| = 2$ is

(A) $\dfrac{\pi}{2}$ 　　　　 (B) $\dfrac{2}{\pi}$ 　　　　 (C) $-\dfrac{\pi}{2}$ 　　　　 (D) Zero

16. The value of the integral $\oint_C \tan z \, dz$, where C is the circle $|z| = 2$ is

(A) $-4\pi i$ (B) $4\pi i$ (C) $2\pi i$ (D) $-2\pi i$

17. A square matrix A of order n is diagonalizable if and only if it has

(A) n equal eigen values

(B) n linearly independent eigen vectors

(C) n linearly dependent eigen vectors

(D) $(n-1)$ linearly independent eigen vectors

18. Let T be a linear mapping from $\Re^3$ into $\Re^2$, where $TX = AX$,

$A = \begin{bmatrix} 1 & 0 & 0 \\ -1 & 0 & 1 \end{bmatrix}$, $X = (x, y, z)^T$. Then, dimension of the range of T is

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

19. The condition number of the matrix $A = \begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$ is approximately equal to

(A) 2.918   (B) 3.152   (C) 2.618   (D) 3.618

20. Every regular space with countable basis is

(A) Hausdrorff   (B) Disjoint   (C) Normal   (D) None of these

21. Compact subset of metric space is

(A) connected   (B) convex   (C) open   (D) closed

22. In Ascolli's lemma, the family F consists of uniformly bounded and ---------- functions

(A) Continuous   (B) Equicontinuous

(C) Differentiable   (D) None of these

23. Let S_7 be the group of permutation of the set $\{1,2,3,4,5,6,7\}$. How many elements of order 6 are there in S_7?

(A) 1170   (B) 1270   (C) 1370   (D) 1470

24. If H and K are two subgroups of G of order 6 and 8, respectively, then the order of HK is 16 if order of $H \cap K$ is

(A) 2   (B) 3   (C) 4   (D) 6

25. Every integral domain is not

(A) Commutative ring   (B) Ring

(C) Field   (D) Abelian group with respect to addition

26. The order and degree of a differential equation: $\dfrac{dy}{dx} = \sqrt{x} + \sqrt{y}$ is

(A) $(1,1)$ (B) $(1,2)$ (C) $(2,1)$ (D) $\left(1, \dfrac{1}{2}\right)$

27. Which of the following equation is an exact equation?

(A) $x^2 y\, dy - y\, dx = 0$ (B) $x\, dy + (3x - 2y) dx = 0$

(C) $(x^2 + 1) dx - xy\, dy = 0$ (D) $2x\, y\, dx + (2 + x^2) dy = 0$

28. The value of integral $\displaystyle\int_{-1}^{1} (1 + x) P_n(x)\, dx$, $(n > 1)$ is equal to

(A) $\dfrac{1}{2n+1}$ (B) $\dfrac{2}{2n+1}$ (C) $\dfrac{n}{2n+1}$ (D) 0

29. The solution of partial differential equation: $(y - z) p + (z - x) q = x - y$ is

(A) $f(x^2 + y^2 + z^2) = xyz$ (B) $f(x + y + z) = xyz$

(C) $f(x + y + z) = x^2 + y^2 + z^2$ (D) $f(x^2 + y^2 + z^2, xyz) = 0$

30. The partial differential equation: $(1 + x^2)\dfrac{\partial^2 u}{\partial x^2} + (5 + 2x^2)\dfrac{\partial^2 u}{\partial x \partial t} + (4 + x^2)\dfrac{\partial^2 u}{\partial t^2} = 0$ is

(A) Elliptic   (B) Parabolic   (C) Hyperbolic   (D) None of these

31. The solution of partial differential equation: $\dfrac{\partial u}{\partial x} = 2\dfrac{\partial u}{\partial t} + u$, where $u(x,0) = 6e^{-3x}$ is

(A) $u = e^{-3x}$ (B) $u = 6e^{-(3x+2t)}$ (C) $u = 6e^{-(2x+3t)}$ (D) $u = 6e^{(2x-3t)}$

32. Boundary conditions which include derivative of boundary value is

(A) Discrete boundary condition (B) Dirichelt boundary condition

(C) Neuman boundary condition (D) Forced boundary condition

33. The basis of polynomial interpolation is based on

(A) Taylor's theorem (B) Weierstrass approximation theorem

(C) Rolle's Theorem (D) Cantor intersection theorem

34. For the data: $\begin{array}{ccccc} x:3 & 6 & 9 & 12 \\ y:-1 & 1 & 2 & 3 \end{array}$, the value of $\int_3^{12} y(x)\,dx$ when computed by Simpson's one-third rule is

(A) 15 (B) 10 (C) 0 (D) 5

35. If $y = a + bx + cx^2$ and $\begin{array}{cccccc} x: & 0 & 1 & 2 & 3 & 4 \\ y: & 1 & 1.8 & 1.3 & 2.5 & 7.3 \end{array}$, then the first normal equation is

(A) $15 = 59 + 10b + 29c$ (B) $15 = 59 + 10b + 27c$

(C) $13.9 = 5a + 10b + 30c$ (D) $34 = 59 + 10b + 27c$

36. The extremal for the functional $I = \int_0^{\frac{\pi}{2}} \left(y'^2 - y\right)dx$ with $y(0) = 0$, $y\left(\dfrac{\pi}{2}\right) = 1$ is

(A) $y = \dfrac{x}{2}$ (B) $y = -\dfrac{x}{2}$

(C) $y = x$ (D) Problem is meaningless

37. The solution of the integral equation: $\varphi(x) = x + \int_0^x (t - x)\varphi(t)\,dt$ is

(A) $\sin x$ (B) $\cos x$ (C) $\tan x$ (D) $\sec x$

38. The integral equation: $y(x) = \int_0^x (x - t)y(t)\,dt - x\int_0^1 (1 - t)y(t)\,dt$ is equivalent to

(A) $y'' - y = 0, y(0) = 0, y(1) = 0$ (B) $y'' - y = 0, y(0) = 0, y'(0) = 0$

(C) $y'' + y = 0, y(0) = 0, y(1) = 0$ (D) $y'' + y = 0, y(0) = 0, y'(0) = 0$

39. $L\{u(t-1)\}$, where $u(t-1)$ is a Heaviside step function is equal to

(A) $\dfrac{e^s}{s}$
(B) $\dfrac{e^{-s}}{s}$
(C) $\dfrac{e^{-s}}{s^2}$
(D) $\dfrac{e^s}{s^2}$

40. The directional derivative of $f(x,y,z)=x\,y^2+y\,z^3$ at the point $(2,-1,1)$ in the direction of vector $\hat{i}+2\,\hat{j}+2\,\hat{k}$ is

(A) $\dfrac{11}{3}$
(B) $-\dfrac{11}{3}$
(C) $\dfrac{13}{3}$
(D) $-\dfrac{13}{3}$

41. The torsion (τ) of the curve $x=a\cos t$, $y=a\sin t$, $z=bt$ is equal to

(A) $\dfrac{a}{a^2+b^2}$
(B) $\dfrac{b^2}{a^2+b^2}$
(C) $\dfrac{a^2}{a^2+b^2}$
(D) $\dfrac{b}{a^2+b^2}$

42. If velocity vector is $\vec{F}=y\,\hat{i}+2\,\hat{j}+x\,z\,\hat{k}$ m/sec., then the flux of water through parabolic cylinder $y=x^2, 0\le x\le 3,\ 0\le z\le 2$ is

(A) $66\,m^3/\sec$
(B) $69\,m^3/\sec$ (C) $72\,m^3/\sec$ (D) $76\,m^3/\sec$

43. The velocity of fluid at any point is a contra variant tensor of rank

(A) One
(B) Two
(C) Three
(D) Four

44. Equation of continuity by Euler method is

(A) $\dfrac{\partial\rho}{\partial t}+\rho\vec{\nabla}.\vec{q}=0$
(B) $\dfrac{\partial\rho}{\partial t}-\rho\vec{\nabla}.\vec{q}=0$
(C) $\dfrac{\partial\rho}{\partial t}+\vec{\nabla}.\rho\vec{q}=0$
(D) $\rho\vec{\nabla}.\vec{q}=0$

45. Generalized co-ordinates are:

(A) Dependent on each other
(B) Independent of each other
(C) Spherical co-ordinate
(D) Cylindrical co-ordinate

46. Lagrange's bracket is

(A) Non-variant
(B) Canonical variant
(C) Canonical invariant
(D) None of these

47. Sample space for an experiment in which three coins are tossed is

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

48. Consider mean, median, mode and skew ness of data, value of skew ness will be negative if

(A) $mean > \mod e$

(B) $mean < \mod e$

(C) $mean < median$

(D) $mean > median$

49. For $x_1, x_2 \geq 0$, consider the system: $x_1 + 2x_2 - x_3 - 2x_4 - 3x_5 = -1$, $2x_2 + x_3 + 5x_4 - 3x_5 = -1$. Its solution $x_1 = 0, x_2 = 1, \ x_3 = 0, \ x_4 = 0, x_5 = 1$ is a

(A) Basic solution

(B) A basic feasible solution

(C) Feasible solution

(D) None of these

50. In a balanced transportation problem with m sources and n destinations, the number of non-basic variables will be

(A) $m\,n$

(B) $(m-1)(n-1)$

(C) $m\,(n+1)$

(D) $n\,(m+1)$

x-x-x

Mechanical Engineering(Ph.D.) (1077)

1. The SI unit of kinematic viscosity (υ) is:

   A) m^2/sec B) kg/m-sec   C) m/sec^2 D) m^3/sec^2

2. For a Newtonian fluid:
   A) Shear stress is proportional to shear strain
   B) Rate of shear stress is proportional to shear strain
   C) Shear stress is proportional to rate of shear strain
   D) Rate of shear stress is proportional to rate of shear strain

3. The pressure gauges G_1 and G_2 installed on the system shown pressures of P_{G1} = 5.00 bar and P_{G2} = 1.00 bar. The value of unknown pressure P is


   A) 1.01 bar   B) 2.01 bar   C) 5.00 bar   D) 7.01 bar
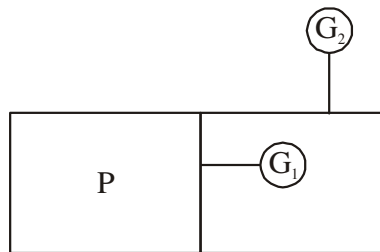
4. For a completely submerged body with centre of gravity 'G' and centre of buoyancy 'B', the condition of stability will be

   A) G is located below B
   B) G is located above B
   C) G and B are coincident
   D) Independent of the locations of G and B

5. In a two-dimensional velocity field with velocities u and v along x and y directions respectively, the convective acceleration along the x-directions is given by

   A) $u\dfrac{\partial u}{\partial x} + v\dfrac{\partial u}{\partial y}$ B) $u\dfrac{\partial u}{\partial x} + v\dfrac{\partial v}{\partial y}$

   C) $u\dfrac{\partial v}{\partial x} + v\dfrac{\partial u}{\partial y}$ D) $v\dfrac{\partial u}{\partial x} + u\dfrac{\partial u}{\partial y}$

6. A two-dimensional flow filed has velocities along the x and y directions given by u = x^2t and v = –2xyt respectively, where t is time. The equation of streamlines is

   A) x^2y = constant   B) $x\ y^2$ = constant
   C) x y = constant   D) Not possible to determine

7. A streamline and an equipotential line in a flow field

    A) Are parallel to each other   B) Are perpendicular to each other

    C) Intersect at an acute angle   D) Are identical

8. In terms of Poisson's ratio (μ) the ratio of Young's Modulus (E) to Shear Modulus (G) of elastic materials is

    A) $2(1 + \mu)$ B) $2(1 - \mu)$ C) $\dfrac{1}{2}(1+\mu)$ D) $\dfrac{1}{2}(1-\mu)$

9. A steel rod of length L and diameter D, fixed at both ends, is uniformly heated to a temperature rise of ΔT. The Young's modulus is E and the coefficient of linear expansion is 'α'. The thermal stress in the rod is

    A) 0   B) $\alpha\,\Delta T$ C) E $\alpha\,\Delta T$ D) E $\alpha\,\Delta T$ L

10. For a ductile material, toughness is a measure of

    A) Resistance to scratching

    B) Ability to absorb energy up to fracture

    C) Ability to absorb energy till elastic limit

    D) Resistance to indentation

11. The stress-strain curve for mild steel is shown in the figure given below. Choose the correct option referring to both figure and table.
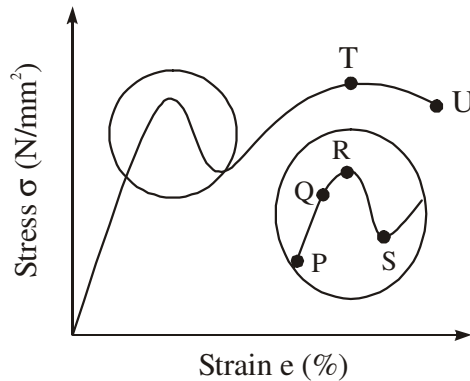
Point on the graph		Description of the point
P.	1.	Upper Yield Point
Q.	2.	Ultimate Tensile Strength
R.	3.	Proportionality Limit
S.	4.	Elastic Limit
T.	5.	Lower Yield Point
U.	6.	Failure

    A) P-1, Q-2, R-3, S-4, T-5, U-6   B) P-3, Q-1, R-4, S-2, T-6, U-5

    C) P-3, Q-4, R-1, S-5, T-2, U-6   D) P-4, Q-1, R-5, S-2, T-3, U-6

12. The figure shows the state of stress at a certain point in a stressed body. The magnitudes of normal stresses in the x and y directions are 100 MPa and 20 MPa respectively. The radius of Mohr's stress circle representing this state of stress is
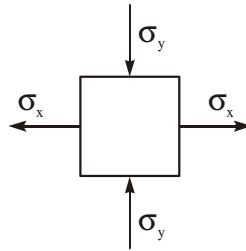

A) 120   B) 80   C) 60   D) 40

13. If the principal stresses in a plane stress problem are $\sigma_1 = 100$ MPa, $\sigma_2 = 40$ MPa, the magnitude of the maximum shear stress (in MPa) will be

A) 60   B) 50   C) 30   D) 20

14. The second moment of a circular area about the diameter is given by (D is the diameter)

A) $\dfrac{\pi D^4}{4}$ B) $\dfrac{\pi D^4}{16}$ C) $\dfrac{\pi D^4}{32}$ D) $\dfrac{\pi D^4}{64}$

15. The beams, one having square cross section and another circular cross-section, are subjected to the same amount of bending moment. If the cross sectional area as well as the material of both the beams are the same then

A) Maximum bending stress developed in both the beams is the same
B) The circular beam experience more bending stress than the square one
C) The square beam experience more bending stress than the circular one
D) As the material is same both beams will experience same deformation

16. Maximum shear stress developed on the surface of a solid circular shaft under pure torsion is 240 MPa. If the shaft diameter is doubled then the maximum shear stress developed corresponding to the same torque will be

A) 120 MPa   B) 60 MPa   C) 30 MPa   D) 15 MPa

17. For a circular shaft of diameter 'd' subjected to torque T, the maximum value of the shear stress is

A) $\dfrac{64T}{\pi d^3}$ B) $\dfrac{32T}{\pi d^3}$ C) $\dfrac{16T}{\pi d^3}$ D) $\dfrac{8T}{\pi d^3}$

18. The spring constant of a helical compression spring DOES NOT depend on

A) Coil diameter   B) Material strength
C) Number of active turns   D) Wire diameter

19. A simply supported laterally loaded beam was found to deflect more than a specified value. Which of the following measures will reduce deflection?

A) Increase the area moment of inertia
B) Increase the span of the beam
C) Select a different material having lesser modulus of elasticity
D) Magnitude of the load to be increased

20. For an underdamped harmonic oscillator, resonance

A) Occurs when excitation frequency is greater than undamped natural frequency.
B) Occurs when excitation frequency in less than undamped natural frequency
C) Occurs when excitation frequency is equal to undamped natural frequency
D) Never occurs

21. The natural frequency of the system shown below is
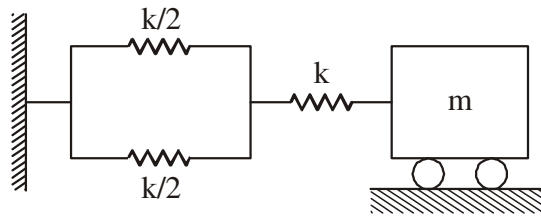
A) $\sqrt{\dfrac{k}{2m}}$ B) $\sqrt{\dfrac{k}{m}}$ C) $\sqrt{\dfrac{2k}{m}}$ D) $\sqrt{\dfrac{3k}{m}}$

22. In descending order of magnitude, the thermal conductivity of (a) Pure iron, (b) liquid water, (c) Saturated water vapour, (d) Pure aluminum can be arranged as

A) a b c d   B) b c a d   C) d a b c   D) d c b a

23. In case of one dimensional heat conduction in a medium with constant properties, T is the temperature at position x, at time t. Then $\dfrac{\partial T}{\partial t}$ is proportional to

A) $\dfrac{T}{x}$ B) $\dfrac{\partial T}{\partial x}$ C) $\dfrac{\partial^2 T}{\partial_x \partial t}$ D) $\dfrac{\partial^2 T}{\partial x^2}$

24. As the temperature increases, the thermal conductivity of a gas

A) Increases
B) Decreases
C) Remains constant
D) Increases up to a certain temperature and then decreases

25. For an opaque surface, the absorptivity (α), transmissivity (τ) and reflectivity (ρ) are related to the equation:

A) $\alpha + \rho = \tau$ B) $\rho + \alpha + \tau = 0$
C) $\alpha + \rho = 1$ D) $\alpha + \rho = 0$

26. For the same inlet and exit temps of the hot and cold fluids, the Log mean temperature difference (LMTD) is
    A) Greater for parallel flow heat exchanger than the counter flow heat exchanger
    B) Greater for counter flow heat exchanger than the parallel flow heat exchanger
    C) Same for both parallel and counter flow heat exchangers.
    D) Depending on the properties of fluid.

27. In a heat exchanger, it is observed that $\Delta T_1 = \Delta T_2$, where ΔT_1 is the temperature difference between the two single phase fluid streams at one end and ΔT_2 is the temperature difference at the other end. This heat exchanger is
    A) A condenser
    B) An evaporator
    C) A counter flow heat exchanger
    D) A parallel flow heat exchanger

28. Saturated vapor is condensed to saturated liquid in condenser. The heat capacity ratio is $C_r = \dfrac{c_{min}}{c_{max}}$. The effectiveness ($\varepsilon$) of the condenser is

    A) $\dfrac{1 - \exp[-NTU(1 + C_r)]}{1 + C_r}$

    B) $\dfrac{1 - \exp[-NTU(1 - C_r)]}{1 - C_r \exp[-NTU(1 - C_r)]}$

    C) $\dfrac{NTU}{1 + NTU}$

    D) $1 - \exp(-NTU)$

29. The primary purpose of sprue in casting mold is to
    A) Feed the casting at rate consistent with the rate of solidification
    B) Act as a reservoir for molten metal
    C) Feed molten metal from the pouring basin to the gate.
    D) Help feed the casting until all solidification takes place

30. Two streams of liquid metal which are not hot enough to fuse properly result into a casting defect known as
    A) Cold shut   B) Swell   C) Blow hole   D) Scar

31. In a gating system, the ratio 1 : 2 : 4 represents
    A) Sprue base area: Runner area : in-gate area
    B) Pouring basin area : in-gate area : Runner area
    C) Sprue base area: in-gate area : casting area
    D) Runner area : in-gate area : Casting area

32. Within the Heat Affected Zone (HAZ) in a fusion welding process, the work material undergoes

A) Microstructural changes but does not melt

B) Neither melting nor microstructural changes

C) Both melting and microstructural changes after solidification

D) Melting and retains the original microstructure after solidification

33. Which two of the following joining processes are autogenous?

i. Diffusion welding   ii. Electroslag welding

iii. Tungsten inert gas welding   iv. Friction welding

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

34. The major difficulty during welding of aluminum is due to its

A) High tendency of oxidation   B) High thermal conductivity

C) Low melting point   D) Low density

35. Formation of build-up edge during machining can be avoided by using

A) Tool with low positive rake angle   B) High feed rate

C) High cutting speed   D) Large depth of cut

36. The figure below shows a graph which qualitatively relates cutting speed and cost per piece produced.
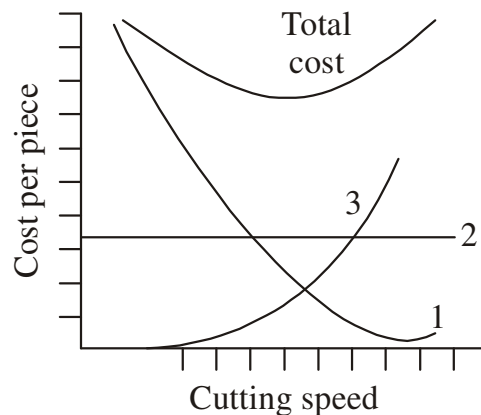
The three curves 1, 2 and 3 respectively represent

A) Machining cost, non-productive cost, tool changing cost

B) Non-productive cost, machining cost, tool changing cost

C) Tool changing cost, machining cost, non-productive cost

D) Tool changing cost, non-productive cost, machining cost

37. Cutting tool is much harder than the workpiece. Yet the tool wears out during the tool-work interaction, because

A) Extra hardness is imparted to the workpiece due to coolant used

B) Oxide layers on the workpiece surface impart extra hardness to it

C) Extra hardness is imparted to the workpiece due to severe rate of strain

D) Vibration is induced in the machine tool

38. In a machining operation, if the generatrix and directrix both are straight lines, the surface obtained
A) Cylindrical
B) helical
C) Plane
D) surface of revolution

39. In order to have interference fit, it is essential that the lower limit of shaft should be
A) Greater than the upper limit of the hole
B) Lesser than the upper limit of the hole
C) Greater than the lower limit of the hole
D) Lesser than the lower limit of the hole

40. In EDM, if the thermal conductivity of tool is high and the specific heat of work piece is low, then the tool wear rate and material removal rate are expected to be respectively.
A) High and high
B) Low and low
C) High and low
D) Low and high

41. In a steady state steady flow process taking place in a device with a single inlet and a single outlet, the work done per unit mass flow rate is given by $w = -\int_{inlet}^{outlet} vdp$, where v is the specific volume and p is the pressure. The expression for w given above

A) Is valid only if the process is both reversible and adiabatic
B) Is valid only if the process is both reversible and isothermal
C) Is valid for any reversible process
D) Is incorrect, it must be $w = \int_{inlet}^{outlet} pdv$

42. The internal energy of an ideal gas is a function of
A) Temperature and pressure
B) Volume and pressure
C) Entropy and pressure
D) Temperature only

43. Which of the following relationships is valid only for reversible process undergone by a closed system of simple compressible substance (neglect changes in kinetic and potential energy)?
A) $\delta Q = dU + \delta W$
B) $T\, dS = dU + pdV$
C) $T\, dS = dU + \delta W$
D) $\delta Q = dU + p\, dV$

44. Environment friendly refrigerant $R134_a$ is used in the new generation domestic refrigerators. It chemical formula is
A) $CH\, C1F_2$
B) $C_2C1_3F_3$
C) $C_2C1_2F_4$
D) $C_2H_2F_4$

45. Dew point temperature is the temperature at which condensation begins when the air is cooled at constant

A) Volume B) Entropy C) Pressure D) Enthalpy

46. If a mass of moist air in an airtight vessel is heated to a higher temperature, then

A) Specific humidity of the air increases
B) Specific humidity of the air decreases
C) Relative humidity of the air increases
D) Relative humidity of the air decreases

47. Simplex method of solving linear programming problem uses

A) All the points in the feasible region
B) Only the corner points of the feasible region
C) Intermediate points within the infeasible region
D) Only the interior points in the feasible region

48. The mechanism used in a shaping machine is

A) A closed 4-bar chain having 4 revolute pairs
B) A closed 6-bar chain having 6 revolute pairs
C) A closed 4-bar chain having 2 revolute and 2 sliding pairs
D) An inversion of the single slider-crank chain

49. The number of inversions for a slider crank mechanism is

A) 6 B) 5 C) 4 D) 3

50. Tooth interference in an external involute spur gear pair can be reduced by

A) Decreasing center distance between gear pair
B) Decreasing module
C) Decreasing pressure angle
D) Increasing number of gear teeth

x-x-x

Microbial Biotechnology(Ph.D.)   (1077)

1. Which of the following bases has the largest hydrogen bonding possibility?

    A) Adenine   B) Guanine   C) Cytosine   D) Uracil

2. Enzymes help lower the activation energies of reactions by

    A) Covalent interactions with substrates
    B) Binding only with the solvent molecules
    C) Changing reaction equilibria
    D) Forming weak interactions with substrates

3. Immediate hypersensitivity reactions are associated with

    A) IgG   B) IgE   C) IgM   D) IgA

4. Proton Motive Force during oxidative phosphorylation is generated in mitochondria by

    A) Exchanging protons for sodium ions
    B) Pumping protons out into inter-membrane space
    C) Pumping hydroxyl ions into the mitochondria
    D) Hydrolysis of ATP

5. The Monod Model relates

    A) Substrate utilized with the biomass consumption
    B) Specific growth rate to the substrate availability
    C) Yield with the biomass utilization
    D) The biomass concentration with specific growth rate

6. A taxonomic system based on all phenotypic similarities equally weighed and without regard to evolutionary relationships, is called

    A) Phylogeny   B) Cladistics
    C) Classical evolutionary taxonomy   D) Phenetics

7. The inner membrane of a mitochondrion is very selective about what it normally allows to enter the organelle. One molecule that regularly passes out of a mitochondrion is

    A) Citric acid   B) ATP   C) Pyruvic acid   D) Glucose

8. When the metabolic rates are low, the production of ATP is slow. The main control over ATP production is allosteric inhibition, by ATP and citric acid, of the enzyme that facilitates formation of

    A) Fructose 1, 6-diphosphate from fructose 6-phosphate
    B) Glucose from glycogen
    C) Acetyl coenzyme A from pyruvic acid
    D) Citric acid from acetyl coenzyme A and oxaloacetic acid

9. Rocky Mountain spotted fever is caused by

A) *Streptococcus agalactiae*   B) *Coxiellaburnetti*
C) *Rickettsia rickettsii*   D) *Yersinia pestis*

10. Prodigiosin, a bright red pigment is produced by

A) *Serratiamarcescens*   B) *Vibrio cholerae*
C) *Enterobacter cloacae*   D) *Clostridium tetani*

11. In analysis of waste water, *Escherichia coli* is used as

A) An indicator of fecal contamination of water
B) A standard organism for performing a plate count
C) An indicator of the number of nitrogen-fixing bacteria in the water
D) A measure of the amino acid content of water

12. A dry wine is produced by yeast when they ferment grapes and

A) Produce large quantities of protein in the wine
B) Produce large number of aromatic compounds
C) Use up all the minerals in the wine
D) Use up all the sugar in the wine

13. The function of *Escherichia coli* DNA polymerase II in the cell is to

A) Initiate replication at the origins
B) Carry out 'fill in' reaction at the Okazaki fragments after RNA primer removal
C) Restart replication at the stalled replication fork
D) Synthesis of leading strand only

14. Okazaki fragments are used to elongate

A) The leading strand towards the replication fork
B) The lagging strand towards the replication fork
C) The lagging strand away from the replication fork
D) The leading strand away from the replication fork

15. The specific growth rate (μ) is defined as

A) The concentration of biomass in the reactor
B) Rate of increase of total biomass in the reactor
C) The rate of individual cells division or increase in their biomass
D) The rate of cell death

16. A shift to lower wavenumber for an absorption in a spectrum corresponds to

A) A shift to lower frequency   B) A loss of intensity
C) A shift to lower wavelength   D) A shift to higher energy

17. Information Technology Act, 2000 was amended in
   A) 2008   B) 2010   C) 2012   D) 2014

18. The cell population to arrive first at the site of inflammation
   A) Monocytes   B) Lymphocytes   C) Neutrophils   D) Eosinophils

19. Which of the following organism is widely used as a biocontrol agent in organic farming?
   A) *Rhizobium tropicii*   B) *Trichodermaviride*
   C) *Fusariumoxysporum*   D) *Nostocmuscorum*

20. The fungal group presently classified under protists is
   A) Zygomycetes   B) Oomycetes   C) Deuteromycetes   D) Discomycetes

21. Cellulose is indigestible by humans because we lack the enzyme that hydrolyses
   A) α-1,4 glycosidic bonds   B) β-1,4 glycosidic bonds
   C) α-1,6 glycosidic bonds   D) long chain polysaccharides

22. The tuberculin test is an example of
   A) Type IV delayed hypersensitivity   B) Allergy reaction
   C) Serum sickness   D) Precipitation reaction

23. Which one of the following statements best describe archaebacteria?
   A) Mostly autotrophic, cell wall contains peptidoglycan, 60S ribosomes, live in extreme environment.
   B) Divide by fission, not susceptible to lysozyme, live in extreme environments, mostly autotrophic
   C) Not susceptible to lysozyme, contain Golgi and linear chromosomes
   D) Chitinous cell wall, obligate aerobic, circular chromosomes

24. Two 16-residue helical peptides A and B are enantiomers. They can be distinguished by
   A) Recording their MALDI mass spectrum
   B) Hydrolysis followed by amino acid analysis
   C) Sequencing by Edman's method
   D) Examining their circular dichroism spectra

25. Which of the following statements is incorrect for fluorescence *in situ* technique?
   A) A fluorescence or confocal microscope is used for detection of signal
   B) A labeled sequence of nucleotides is used
   C) Specific fluorescence tagged antibodies are used
   D) A stringent washing step is essential to remove appearance of non specific signal

26. International Biological Diversity Day is celebrated on

    A) 22nd May   B) 14th May   C) 22nd December   D) 1st December

27. Turbidostat is recommended when continuous fermentation needs to be carried out at

    A) High dilution rates near the wash out point
    B) Low dilution rates near the wash out point
    C) Moderate dilution rates near the wash out point
    D) Any intensity of dilution rates near the wash out point

28. When bacteria growing at $20^{o}C$ are warmed at $37^{o}C$, they are most likely to synthesize membrane lipids with more

    A) Short chain saturated fatty acids   B) Short chain unsaturated fatty acids
    C) Long chain saturated fatty acids   D) Long chain unsaturated fatty acids

29. Beating of cilia is regulated by

    A) Actin   B) Myosin   C) Cofilin   D) Nexin

30. 'Segregation of alleles can occur at Anaphase I or at Anaphase II of meiosis'. With reference to this statement, which one of the following organism is an ideal model system for identifying stage of allelic segregation at meiosis?

    A) *Neurosporacrassa*   B) *Saccharomyces cerevisiae*
    C) *Drosophila melanogaster*   D) *Pisumsativum*

31. In Scanning Electron Microscope, to form an image of the specimen

    A) Electron should pass through the specimen
    B) Electrons are scattered from the surface of the specimen
    C) A thin film of heavy metal is evaporated
    D) Specimens are stained

32. Chromosome walking is best described as

    A) Aligning DNA sequences by computer to generate contigs
    B) Generating a map along a chromosome in a step-by-step manner
    C) Identifying clones whose inserts overlap to generate a library of clones that cover a given segment of DNA
    D) Sequencing a genome at a time to ensure that no gaps are present at the end

33. A major problem with computational assembly of DNA sequences of complex eukaryotic genomes is the presence of

    A) Multiple chromosomes   B) Mitochondrial DNA
    C) Introns within the genome   D) Repetitive sequence

34. The biomass of one trophic level getting incorporated into the biomass of the next trophic level is the

A) Relative ratio of energy level   B) Energy flow efficiency
C) Ecological efficiency   D) Ecological gradient

35. The five carbon sugar of Calvin-Benson cycle that originally captures CO_2 is

A) Pyruvate   B) Ribose
C) Oxaloacetate   D) Ribulose bisphosphate

36. The filamentous DNA and protein that can be stained in interphase nuclei is called

A) Solenoid   B) Nucleosome   C) Chromatin   D) Polytene

37. Based on per molecule, which of the following gas has the most powerful greenhouse effect?

A) CO_2 B) CH_4 C) N_2O D) CFCs

38. The protein that guides the transfer of F factor through the pilus is called

A) Chaperone   B) Pilot   C) Leader   D) Signal

39. Which one of the following would contribute to intrinsic fluorescence to a protein?

A) Aromatic amino acids   B) Disulfide bonds
C) Charged amino acids   D) Branched chain amino acids

40. A 1% (w/v) solution of a sugar polymer is digested by an enzyme (20µg, MW=2,00,000). The rate of monomer sugar (MW= 400) liberated was determined to have a maximal initial velocity of 10mg formed/min. The turnover number (min^{-1}) will be

A) 5×10^4 B) 2.5×10^{-2} C) 4×10^{-6} D) 2.5×10^5

41. In bacteria, heat shock response is primarily controlled by

A) σ^S B) σ^{32} C) σ^E D) σ^{70}

42. 'FlavrSavr' transgenic tomato variety was made more resistant to rotting by adding an antisense gene which interferes with the production of

A) 1-amino cyclopropane-1-carboxylic acid synthase
B) 1-amino cyclopropane-1-carboxylic acid oxidase
C) Expansin
D) Polygalacturonase

43. The first genome annotation software system was designed in 1995

A)   Tai   B) David Lipman   C) Owen White   D) Ben Hesper

44. CD 19 is a marker for

    A) B cells   B) T cells   C) macrophages   D) NK cells

45. Which of the following scientist first showed mutually beneficial relationship between bacteria and leguminous plants?

A) H. Hellriegel and H. Wilfarth
B) Nocard and Roux
C) Sergei Winogradsky and Martinus Willem Beijerinck
D) Welch and Nuttall

46. Which of the following is used in Ames test?

    A)*E. coli*   B) *Streptococcus aureus*
    C) *Pseudomonas aeruginosa*   D) *Salmonella typhimurium*

47. Cis-trans isomerization of the peptide bond preceding an amino acid X is known to be critical in the folding of proteins by slowing down the folding reaction. The amino acid X is

    A) Isoleucine   B) Tryptophan   C) Proline   D) Histidine

48. Pyrosequencing derives its name from the fact that

A) It detects pyrophosphate released during base incorporation
B) The bases are detected by pyrolysis
C) It uses enzyme apyrase to detect the bases
D) It generates pyrograms

49. Which of the antibiotic attaches to 50S ribosome and inhibits peptidyl transferase activity?

    A) Penicillin   B) Chloramphenicol
    C) Trimethoprim   D) Amphotericin

50. Which of the following organisms has the minimal genome?

    A) *E. coli*   B) *Helicobacter pylori*
    C) *Methanococcusjannaschii*   D) *Mycoplasma genitalium*

x-x-x

Microbiology(Ph.D.) (1077)

1. Glucose-6-phosphate inhibits which of the following enzymes

   A) Glucokinase
   B) Hexokinase
   C) Phosphorylase kinase
   D) Fructose-1, 6-bisphosphatase

2. *Which of these is anti bacterial preservative*

   A) *Metabisulphite*
   B) *Banzoate*
   C) *Propionate*
   D) *Sorbate*

3. A highly aerobic and metabolically versatile organism used in oil spill clearing is

   A) *Mycobacterium smegmatis*
   B) *Azotobacter vinelandii*
   C) *Pseudomonas cepacia*
   D) *Leuconostoc mesenteroides*

4. *Artificial transformation in laboratory is carried out by treating the cells with*

   A) $MgCl_2$
   B) $CaCl_2$
   C) $NaCl$
   D) HCl

5. Agar is obtained form
   A) Brown algae
   B) Red algae
   C) Green algae
   D) Blue-green algae

6. *Who of the following introduced the use of slant culturing as a means of culture preservation*
   A) *Robert Koch*
   B) *Louis Pasteur*
   C) *Joseph Lister*
   D) *John Tyndall*

7. *Which type of spores are produced asexually in fungi?*

   A) *Conidiospores*
   B) *Ascospores*
   C) *Basidiospores*
   D) *Zygospores*

8. *Blotting techniques are known for the following except:*

   A) *RNA*
   B) *DNA*
   C) *Proteins*
   D) *Lipids*

9. *Bacteria are more sensitive to antibiotics at which phase of growth curve?*

   A) *Decline phase*
   B) *Stationary phase*
   C) *Lag phase*
   D) *Log phase*

10. How many moles of ethanol can be produced upon the fermentation of 1 mole of xylose

    A) 1
    B) 1.67
    C) 2
    D) 2.67

11. Which of the following is debranching enzyme

    A) α-amylase
    B) β-amylase
    C) Glucoamylase
    D) α-glucosidase

(2)

12. *Which of the following is an example of RNA virus?*

A) SV 40 virus

C) *Tobacco mosaic*

B) T4 phage

D) *Adeno virus*

13. The diagrammatic representation of the total no. of genes in DNA is

A) Genome

C) Gene-structure

B) Gene map

D) Chromatin

14. *Double standard RNA is seen in*

A) *Reo virus*

C) *Parvo virus*

B) *Rhabdo virus*

D) *Retro virus*

15. What is the triglyceride and alcohol operating ratio generally used in transesterification reaction used for biodiesel production

A) 1: 3

C) 1:5

B) 1:4

D) 1:6

16. Which of these is xylose fermenting yeast

A) *Saccharomyces cerevisiae*

C) *Saccharomyces carlbergensis*

B) *Pichia stipitis*

D) *Saccharomyces uvarum*

17. *DNA-replication is by the mechanism of*

A) *Conservative*

C) *Dispersive*

B) *Semi-conservative*

D) *Semi-disruptive*

18. How many ATP molecules are produced upon fermentation of 1 mole of glucose by *Zymomonas mobilis*

A) 1

C) 36

B) 2

D) 38

19. *Microorganisms   usually   make acetyl CO-A by oxidizing*

A) *Acetic acid*

C) *α-ketoglutaric acid*

B) *Pyruvic acid*

D) *Fumaric acid*

20. *Rancidity in spoiled foods is due to*

A) *Lipolytic organisms*

C) *Toxigenic microbes*

B) *Proteolytic organisms*

D) *Saccharolytic microbes*

21. *Fermentation is an energy generating process involving*

   A) *Electron transport chain*
   B) *Oxidative phosphorylation*
   C) *Photophosphorylation*
   D) *Substrate level phosphorylation*

22. *Neurons remain in which of the following stages of cell cycle:*

   A) *G1 – phase*
   B) *S – phase*
   C) *G2 – phase*
   D) *G_o– phase*

23. *Nitrites are oxidized to nitrates by a microorganism*
   A) *Nitrosomonas*
   B) *Nitrosococcus*
   C) *Nitrobacter*
   D) *Azotobacter*

24. *Which one of the following mutagens act only on replicating DNA?*

   A) *Ethidium bromide*
   B) *Nitrosogeranidine*
   C) *Acridine orange*
   D) *Nitrous acid*

25. Which of the following enzymes in algae is involved in the biological production of hydrogen by photolysis of water
   A) Nitrogenase
   B) Zymase
   C) Phophoenol pyruvate
   D) Hydrolyase

26. Penicillin resistance in *Staphylococcus aureus* may be acquired by:

   A) Transformation
   B) Transduction
   C) Conjugation
   D) Mutation

27. Classical pathway of the complement is activated by:

   A) Antigen
   B) Antibody
   C) Antigen-Antibody complex
   D) Hapten

28. Which of the following HLA types is associated with rheumatoid arthritis?

   A) HLA-B27
   B) HLA-DR4
   C) HLA-A1
   D) HLA-DR6

29. Lens protein of eye is an example of:

   A) Sequestered antigen
   B) Neoantigen
   C) Cross-recating foreign antigen
   D) Exposed antigen

30. Which of the following bacterial cultures show red fluorescence when exposed to UV light?
   A) *Bacteroides fragilis*
   B) *Prevotella melaninogenica*
   C) *Prophyromonas gingivalis*
   D) *Fusobacterium nucleatum*

31. Which of the following *Shigella* species does not ferment mannitol?

A) *Shigella dysenteriae*   C) *S. sonnei*
B) *S. boydii*   D) *S. flexneri*

32. The most widely used disinfectant for human immunodeficiency virus (HIV) infected material is:

A) Hypochlorite solution   C) Formaldehyde
B) Lysol   D) Mercuric chloride

33. Which of the following vaccines is a killed vaccine?

A) Measles virus   C) Rabies virus
B) Rubella vaccine   D) Mumps vaccine

34. Sebaceous glands do not secrete

A) Lysozyme   C) Short chain fatty acids
B) High NaCl   D) Transferrin

35. All of the following are coagulase negative staphylococci except:

A) *Staphylococcus epidermidis*   C) *Staphylococcus aureus*
B) *Staphylococcus saprophyticus* D) *Staphylococcus haemolyticus*

36. *N. gonorrheae* can cause

A) Conjuctivitis   C) Sore throat
B) Pylonephritis   D) Non-specific urethritis

37. What is the generation time of *Mycobaterium leprae*?

A) 20 minutes   C) 12-13 days
B) 20 hours   D) 20 weeks

38. Which of the following are known as prokaryotic viruses

A) Probiotics   C) Bacteriophages
B) Prebiotics   D) Viriods

39. Which of the following is the smallest virus?

A) Papovavirus   C) Adenovirus
B) Parvovirus   D) Reovirus

40. Expression of which combination enables the B-cells to endocytose the antigen

A) IgG and IgM   C) IgM and IgA
B) IgG and IgA   D) IgM and IgD

41. Which of the following is most severely affected in Kala- azar

A) Liver
B) Spleen
C) Adrenal gland
D) Bone

42. Synergy of synbiotics can be expected in

A) Upper respiratory tract
B) Lower respiratory tract
C) Anterior gastrointestinal tract
D) Posterior gastrointestinal tract

43. Which antibody is responsible for systemic lupus erythematosus?

A) Antiplatelet antibodies
B) Antinuclear antibodies
C) Anti-monocytic antibodies
D) Anti-RBC antibodies

44. Who introduced the techniques of sterlisation?

A) Robert Koch
B) Louis Pasteur
C) John Needham
D) Joseph Lister

45. Which is the first human disease proved to be of viral origin?

A) Japanese encephalitis
B) Yellow fever
C) Dengue
D) Small pox

46. J chain is present in:

A) IgG
B) IgM
C) IgD
D) IgE

47. Delayed Hypersensitivity reaction is mediated by:

A) T lymphocytes
B) B lymphocytes
C) Macrophages
D) Neutrophils

48. During maturation, when a purine is replaced by pyrimidine and vice-versa, it is named:

A) Transversion
B) Transition
C) Induced mutation
D) Transfection

49. The following may cause teratogenic infections except?

A) Toxoplasma
B) Cytomegalovirus
C) Rubella virus
D) Trypanosoma

50. Which of the following toxins is responsible for Staphylococcal scalded skin syndrome?

A) Enterotoxin
B) Leucocidin
C) Haemolysin
D) Exfoliative toxin

x-x-x

Music (Vocal and Instrumental) (1077)

1. The sound used for music is technically known as
   A) Anhat Nada
   B) Ahat Nada
   C) Rava
   D) All of these

2. Experiment 'Sarna chatushtai' was done to prove
   A) Swara
   B) Gram
   C) Jati
   D) Shruti

3. Which pair of swara has two shrutis each
   A) Gandhar and Pancham
   B) Gandhar and Dhaivet
   C) Gandhar and Nishad
   D) Gandhar and Shadja

4. 'Dwadash swara Murchhana' is propounded by
   A) Bharat
   B) Sharangdev
   C) Narad
   D) Matanga

5. Which is not the lakshan of a Jati
   A) Ansha
   B) Pakad
   C) Tar-Mandra
   D) Grah

6. 'Virud 'is related with the singing style
   A) Tappa
   B) Prabandha
   C) Thumari
   D) Khyal

7. Instrument used in vedic period
   A) Rabab
   B) Sarod
   C) Veena
   D) Sitar

8. Number of Bhaktis in Samagana
   A) Four
   B) Six
   C) Three
   D) Five

9. Gayan Shaily related with holi festival
   A) Dhamar
   B) Dhrupad
   C) Chaturahd
   D) Tappa

10. Dagur Bani is associated with
    A) Dhrupad Gayki
    B) Khyal Gayaki
    C) Thumari Gayaki
    D) Tappa Gayaki

11. Author of Raga Tarangini is
   A) Pt. Somnath
   B) Pt. Lochan
   C) Pt. Hridaya Narayan Dev
   D) Pt. Shrinivas

12. Dashvidh Raga Vargikaran is mentioned in the grantha
   A) Sangeet Darpan
   B) Sangeet Parijat
   C) Sangeet Ratnakar
   D) Sangeet Makrand

13. Raga-Ragini system was prevalent in
   A) Ancient period
   B) Vedic period
   C) Modern period
   D) Medieval period

14. Who is not sitar player
   A) Pt. Ravi Shankar
   B) Ustad Inayat Khan
   C) Ustad Ali Akbar Khan
   D) Ustad Vilayat Khan

15. Laggi is used in
   A) Khayal
   B) Thumri
   C) Dhrupad
   D) Tarana

16. Which Instrument is used as drone
   A) Sarangi
   B) Tanpura
   C) Bansuri
   D) Veena

17. First matra (Beat) of a Tala is Known as
   A) Khali
   B) Sam
   C) Vibhag
   D) Avartan

18. How many vibhagas are there in Ektala
   A) Six
   B) Four
   C) Five
   D) Two

19. Notation system was created by
   A) PT. Bhimsen Joshi
   B) Pt. V.N. Bhatkhande
   C) Pt. Ram Narayan
   D) Pt. Kishan Moharaj

20. Ratnakosh 'Term'is used for the chapter in which grantha
   A) Sangeet Makrand
   B) Sangeet Samayasar
   C) Sangeet Parijat
   D) Sangeet raj

21. Frequency is related to
   A) Magnitude
   B) Pitch
   C) Vibraton
   D) Timber

22. Which pair of Raga has similar swaras
    A) Main ki Todi –Gujri Todi
    B) Rageshri- Bageshri
    C) Bhoopali- Deshkar
    D) Puriyakalyan- Puria Dhanashri

23. The number of Sthayee Bhava is
    A) Twenty three   C) Nine
    B) Thirty Three   D) Ten

24. Kishori Amonkar belongs to
    A) Kirana Gharana   C) Patiala Gharana
    B) Delhi Gharana   D) Jaipur Gharana

25. 'Dir Da Dir Da Ra Da Da Ra'bols are used in
    A) Rajakhanigat   C) Sitarkhanigat
    B) Maseetkhanigat   D) Firozkhanigat

26. The founder of kirana Gharana
    A) Ustad Abdul Karim Khan   C) Ustad Faiaz Khan
    B) Ustad Vilayat Hussein Khand.   D) Ustad Kallan Khan

27. The swar sangati 'Ni Dha Ni Sa' is used in Raga
    A) Darbari Kanda   C) Main Ki Sarang
    B) Bageshri   D) Main Malhar

28. Which Raga is not suppose to be sung in the morning
    A) Bhairav   C) Lalit
    B) Malkauns   D) Gujri Todi

29. '4-3-2-4-3-4-2' shruti division is related with
    A) Shadjgram   C) Gandhargram
    B) Madhyamgram   D) None of these

30. The oldest sangeet sammelan is
    A) Swami Haridas sangeet sammelan
    B) Tansen sangeet sammelan
    C) Baba Harivallabha sangeet sammelan
    D) Shankarlal Sangeet Sammelan
31. Sangtivadya used for dhrupad gayan
    A) Tabla   C) Dhol
    B) Pakhawaj   D) Dholak

32. Key singnature in staff notation is to indicate
A) Raga
B) Swara
C) Tala
D) Laya

33. Magazine published from sangeet karyalaya Hathras is
A) Sangeet Kala Vihar
B) Sangeet
C) Sangeet Natak
D) Bageshri

34. Which is not shadav – shadav raga
A) Puria
B) Marwa
C) Bilaskhani Todi
D) Gujri Todi

35. 'Ne Re Ga Ni Re Sa' phrase is of
A) Mahar Anga
B) Kalyan Anga
C) Todi Anga
D) Bhairav Anga

36. Which is not authored by Pundrik Bitthal
A) Raga mala
B) Raga Darpan
C) Raga Manjari
D) Sadragchandrodaya

37. In which system of singing bhasha vibhasha are placed
A) Giti
B) Bani
C) Prabandha
D) Dhruva giti

38. Which are two parts of Samaveda
A) Archik, Gana
B) Gatha, Gana
C) Archik, Gatha
D) Gatha, Geet

39. What is 'Ela'
A) Jati
B) Murchhana
C) Alankar
D) Prabandha

40. 'Tirkit' Bol is used in Tala
A) Teen tala
B) Dhamar
C) Ek tala
D) Deepchandi

41. Who has made the first attempt to establish swaras on the string of veena
A) Pt. Lochan
B) Pt. Ahohal
C) Pt. Bhav Bhatt
D) Pt. Hridaya Narayana

42. Who is the Author of Mahabharta
A) Kalidas
B) Valmiki
C) Krishan Dvaipayan Vyas
D) Vishvamitra

43. Which of the following pair of Ragas has the same notes but different Thaat
A) Bhopali-Deshkar
C) Bahar-Main malhar
B) Puriya-Sohni
D) Todi- Multani

44. Name the Gharana famous for Ashtang Gayaki
A) Agra Gharana
C) Jaipur Gharana
B) Gwalior Gharana
D) Delhi Gharana

45. Name the Instrument that was used by Luv- Kush for singing Ramayana
A) Panav
C) Shankha
B) Mridanga
D) Veena

46. Editing in Music production is
A) Recording of track
B) Cut, trim, copy, paste different parts of record
C) Adjust volume levels
D) Complete the track for public to listen

47. First Raga of Sri. Guru Granth Sahib is
A) Asa
C) Ramkali
B) Basant
D) Shree

48. Ledger lines are used
A) To write key signature
B) To write notes in addition to clef
C) To write line bars
D) To write essential key signature

49. How many 'vyabhichari Bhavas'are mentioned in Natyashastra
A) Eight
C) Thirty six
B) Nine
D) Thirty three

50. Difference in Anibaddh and Nibaddha gana is because of
A) Gamak
C) Alankar
B) Meend
D) Tala

x-x-x

Nanoscience & Nanotechnology(Ph.D.)   (1077)

1. FTIR spectrum of a molecule shows a peak at 1650 cm^{-1}. The most likely origin of the peak is due to the stretching of:
   A) >C=C<   B) C-O   C) C-N   D) O-O

2. How many fundamental vibrations are possible for a non-linear N-atomic molecule:

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

3. Which one is the correct order according to the energy for the electronic transitions:

   A) σ-σ*>σ-π*>π- π*>n- π*   B) π- π*>n- π* >σ-σ*>σ-π*
   C) σ-σ*<σ-π*>π- π*<n- π*   D) σ-σ*<σ-π*<π- π*<n- π*

4. In the electromagnetic spectrum, which one of the following better represents the visible region?
   A) 400-900 nm   B) 300-600 nm   C) 500-800 nm   D) 400-700 nm

5. According to the Shockley-Queisser limit for a single p-n junction solar cell, the maximum theoretical power conversion efficiency of a solar cell made of materials having the band gap of 1.34 eV is:
   A) 33.7 %   B) 34.8 %   C) 50.5 %   D) 40.7 %

6. Circadian rhythm is related to:

   A) Cycle that regulates many physiological processes like when to sleep, eat, rise, etc.
   B) Cell death and replication cycle
   C) Social habits
   D) Juvenile activities

7. UV-Visible absorption spectra of different gold nano-rods exhibit:

   A) Two peaks withvariable longitudinal and invariant transverse surface plasmon resonance absorptions depending on the aspect ratio.
   B) Two peaks with invariant longitudinal and variable transverse surface plasmon resonance absorptions depending on the aspect ratio.
   C) One overlapping peak corresponding to longitudinal and transverse surface plasmon resonance.
   D) Two peaks with invariant longitudinal and transverse surface plasmon resonance absorptions depending on the aspect ratio.

8. Plastids are found in:

   A) Animal cells   B) Plant cells
   C) Both animal and plant cells   D) Neither animal cells nor plant cells

9. In which process four daughter cells are formed with half the chromosomes to that of parent cells?
   A) Mitosis   B) Meiosis
   C) Both meiosis and mitosis   D) Asexual reproduction

10. Cells present in Fungi are:

A) Prokaryotic cells   B) Eukaryotic cells
C) Both prokaryotic and eukaryotic cells   D) Viruses

11. Michaelis-Menten equation is related to:

A) DNA replications   B) Enzyme reactions
C) Mitosis   D) Cell division

12. 'Activated carbon is used to remove odor' – for this process, which of the following statement is correct?
A) Activated carbon is adsorbent while odor is adsorbate
B) Activated carbon is adsorbate while odor is adsorbent
C) Both activated carbon and odor are adsorbent
D) Both activated carbon and odor are adsorbate

13. 'Platinum nanoparticles can be used as catalyst for fuel cell application where H_2 is catalytically converted into H^+ ions' – for this process, which of the following statement is correct?
A) Adsorption of H_2 on Pt surface is known as chemisorption
B) Adsorption of H_2 on Pt surface is known as physisorption
C) Adsorption of H_2 on Pt surface is a reversible process
D) All of the above statements are incorrect

14. 'A cup of tea is warmed using a microwave oven'- liquor is warmed due to:

A) Molecular vibrationsof water molecules
B) Molecular rotations of water molecules
C) Nuclear magnetic resonance of water molecules
D) Fragmentation reactions of water molecules

15. Which of the following spectroscopic techniques are complementary to each other?

A) NMR and FTIR spectroscopy   B) Raman and UV-visible spectroscopy
C) Raman and FTIR spectroscopy   D) None of these

16. What is the hybridization state of carbon in pure/pristinesingle walled carbon nanotubes?

A) SP^2 B) SP^3 C) SP   D) All of these

17. Nanostructures or Nanoparticles are defined as:

A) Materials having any one of the dimension in the range $10 – 1000$ Å
B) Materials having one of the dimension in the range $1 – 100$ Å
C) Materials having one of the dimension in the range $100 – 1000$ nm
D) Materials having one of the dimension in the range $10 – 1000$ nm

18. Which of the following is an allotrope of carbon?

A) Graphene   B) MoS_2 sheet   C) h-BN sheet   D) Q-dot

19. Which of the following statement is a correct statement?

A) Both animal cells and plant cells have mitochondria
B) Animal cells have mitochondria but plant cells don't have mitochondria
C) Plant cells have mitochondria but animal cells don't have mitochondria
D) Both animal cells and plant cells don't have mitochondria

20. Prokaryotic cells are divided by:

A) Only mitosis   B) Only meiosis
C) Both mitosis and meioss   D) Binary fission

21. The type of hybridization of each carbon in C_2H_2?

A) sp^3, sp^3 B) sp, sp   C) sp^2, sp^2 D) sp, sp^3

22. Which one of the following has the strongest hydrogen bonding?

A) HF   B) HCl   C) HBr   D) HI

23. Albert Einstein got the novel prize in Physics (1921) for the discovery of:

A) Photoelectric effect   B) Theory of relativity
C) Philosophy   D) Gravitational wave

24. Any single d-orbital can accommodate up to:

A) 2 electrons with opposite spin numbers
B) 2 electrons in same spin numbers
C) 6 electrons
D) 10 electrons

25. What is the oxidation number of Mn in $KMnO_4$?

A) -1   B) +4   C) +7   D) -2

26. The number of sigma bonds and pi-bonds in CH_3-CH=C=CH-CH_3 are (respectively):

A) 9, 3   B) 7, 2   C) 9, 2   D)12, 2

27. 'Tears of Wine' phenomenon is a result of:

A) Micelle formation   B) Emulsification
C) Over drinking   D) Surface tension

28. A dispersion of gold nanoparticles of size 5 nm in water appears wine red due to

    A) Reaction with water   B) Electronic transition in Gold ions
    C) Surface reactions of gold nanoparticles   D)Surface plasmon resonance

29. A researcher developed a superhydrophobic coating using a nanoparticle based formulation. What should be the water contact angle of a surface coated with the formulation?

    A) $0°$ B) $> 150°$ C) $< 100°$ D) $90°$

30. What will be the work done by an ideal gas when it is isothermally expanded from an initial volume V_i to a final volume V_f at constant temperature T (gas constant R).

    A) $W = nRT \ln(V_f/V_i)$ B) $W = nRT (V_f/V_i)$
    C) $W = PV$ D) $P\Delta V = nRT$

31. Which one of the following is a direct band gap semiconductor?

    A) GaAs   B) Si   C) Ge   D) AlSb

32. A p-n junction Si solar can be fabricated using respective doping of:

    A) As, As   B) Al, B   C) B, As   D) As, P

33. Arrange the following according to the thermal conductivity

    A) Copper >mercury >wood   B) Mercury = copper <wood
    C) Mercury <wood<copper   D) Copper >wood>mercury

34. Carbon nanotubes can be functionalized with Pyrenes due to:

    A) n-π interactions   B) π-π interactions
    C) Sigma bond formation   D) Covalent organization

35. Which one of the following is chemically more reactive?

    A) Single walled carbon nanotubes   B) Fullerenes
    C) Diamond   D) Multi-walled carbon nanotubes

36. The by-product of a polymer electrolyte/proton exchange membrane fuel cell is:

    A) CO_2 B) H_2O C) H_2 D) CO

37. What is the primary fuel used in a phosphoric acid fuel cell?

    A) CO_2 B) H_2O C) H_2 or CH_4 D) H_2PO_4

38. Which of the following fuel cell does not need noble metal catalyst for its operation?
    A) Alkaline fuel cell
    B) Polymer electrolyte membrane fuel cell
    C) Molten carbonate fuel cell
    D) Direct methanol fuel cell

39. Which one of the following is not known for hydrogen storage application?
   A) Carbon nanotubes
   B) Metal hydrides
   C) CdS Q-dots
   D) Ammonia boranes

40. The first successful use of fuel cell in space technology was:
   A) NASA Apollo mission
   B) ISRO lunar mission
   C) International Space Station
   D) Voyager-2 mission

41. Montmorillonite is a:
   A) Clay
   B) Fiber nanocomposite
   C) Kind of a beetle
   D) Carbon allotrope

42. Boeing 787 Dreamliner aircraft is made of:
   A) ~ 50 % composite materials
   B) ~ 50 % stainless steel
   C) ~ 50 % aluminium
   D) ~ 50 % carbon nanotubes

43. Which of the following technique is a destructive analysis to samples?
   A) Mass spectroscopy
   B) FTIR spectroscopy
   C) UV-visible spectroscopy
   D) H^1NMR

44. Which one of the following is not a fire retardant material?
   A) Cellulose
   B) Layered silicates
   C) Melamine
   D) Borax

45. Which one of the following is a Newtonian fluid (under ordinary condition)?
   A) Water containing O.0001 M NaCl
   B) Blood
   C) Emulsion paint
   D) Ketchup

46. Which one of the following is not a bio-nanocomposite material?
   A) Clay
   B) Spider silk
   C) Bone
   D) Abalones shells

47. Four solar cells A, B, C, and D having the respective Fill Factors (%) X_1, X_2, X_3, and X_4 where $X_4 > X_2$ and $X_3 < X_1 < X_2$. What would be expected power conversion efficiencies of A, B, C, D?
   A) A>B>C>D
   B) D>B>A>C
   C) C<B<D<A
   D) A<B<C<D

48. Four nanoparticles with a volume of 1 cubic cm are formed by different methods having the shapes: cube, octahedron, sphere, and tetrahedron. Which one will have the highest surface area?
   A) Sphere
   B) Tetrahedron
   C) Cube
   D) Octahedron

49. Which of the following techniques can detect the surface functionalization of carbon nanotubes?
   A) Raman spectrometer
   B) AFM
   C) TEM
   D) SEM

50. According to Moore's Law, what one of the following will become double every year?
   A) Density of transistors
   B) Thickness of gate
   C) Resolution of TEM
   D) Cost of nanoscale devices

x-x-x

Nuclear Medicine(Ph.D.) (1077)

1. Mark the sufficient activity to evaluate the intrinsic uniformity of a planar gamma camera:

    A) 20 µCi B) 200 µCi C) 2 mCi D) 20 mCi

2. Typical energy spectrum of Tc-99m from a patient contains broad peak around 90-140KeV that is not seen in the energy spectrum from point source of Tc-99m. This represent:

    A) Iodine escape peak B) Signal from Tc-99m
    C) Lead x-ray peak D) Compton scatter

3. Name the investigation of choice to detect neck lymph node involvement in well-differentiated [1]thyroid carcinoma:
    A) Magnetic Resonance Imaging
    B) Contrast Enhanced Computed Tomography
    C) Ultrasonography
    D) F-18 flourodeoxy glucose

4. Which one is the most radiosensitive cell among the following:-

    A) Red Blood Cells B) Granulocytes
    C) Lymphocytes D) Neurons

5. A typical pattern of uptake positive for infection on leukocyte and marrow imaging:

    A) Uptake and extent of leukocyte accumulation equal to marrow imaging tracer uptake

    B) Uptake and extent of leukocyte accumulation is more and discordant with marrowimaging tracer uptake
    C) Uptake and extent of leukocyte accumulation is less than marrow imaging tracer uptake
    D) Any pattern of leukocyte accumulation irrespective of marrow imaging uptake

6. Name the drug that may interfere with tracer uptake in the thyroid gland

    A) α-blockers B) β-blockers
    C) Calcium channel blocker D) Amiodarone
7. Which diagnostic criterion for gastrointestinal bleeding localization using Tc-99m labelled red blood cells is not true:
    A) Abnormal activity increases over time
    B) Abnormal activity can progress through bowel in antegrade manner
    C) Abnormal activity can progress through bowel in retrograde manner
    D) Focal area of increased activity accumulation that does not move within the Bowel

8. Which drug is normally used for cerebral blood flow reserve in brain SPECT study:

    A) Captopril   B) Furosemide   C) Dobutamine   D) Acetazolamide

9. F-18 FDG uptake is influenced by all except:

    A) Blood glucose level
    B) Multidrug resistance p-glycoprotein
    C) Tumor growth rate
    D) Glucose transporter -1 expression

10. The following statements regarding radionuclide therapy for bone pain palliation are true except:

    A) Bone pain palliation therapy is indicated in widespread skeletal involvement
    B) Bone pain palliation therapy does not have the anti-tumoral effect
    C) Bone pain palliation therapy has transient bone marrow suppression as adverse effect
    D) Bone pain palliation therapy can be used in patients with osteolytic skeletal lesions

11. All the statements are true regarding peptide receptor radionuclide therapy (PRRT) except:

    A) Radiolabelled somatostatin analogues are more effective than somatostatin analogues in treatment for metastatic/inoperable neuroendocrine tumor
    B) Lu-177 DOTATATE therapy is less effective than In-111-DTPA octreotide therapy
    C) Lu-177 is not pure β-emitter
    D) Haematological and renal toxicities are usually seen with PRRT

12. Which scan is not used to detect musculoskeletal infection:

    A) Tc-99m HMPAO labelled leukocyte
    B) Tc-99m labelled RBC scan
    C) F-18 FDG PET/CT scan
    D) Ga-67 citrate scan

13. Which statement is true about Radiation Hormesis theory :

    A) Related to beneficial effects of high level radiation exposure
    B) Related to beneficial effects of low level radiation exposure
    C) Related to harmful effects of high level radiation exposure
    D) Related to harmful effects of low level radiation exposure

14. Tc-99m sulphur colloid is used in all conditions except:

    A) Gastro-intestinal bleeding
    B) Direct Radionuclide Cystouretherography
    C) Sentinel lymph node biopsy
    D) CSF leak assessment

15. Which one is known as mock technetium:

A) Co-57   B) Co-60   C) Ba-133   D) Tc-99

16. Which is the false statement regarding phase analysis of gated SPECT myocardial perfusion imaging (MPI) for the assessment of LV dyssynchrony:
    A) Routine gated SPECT MPI can be used for dyssynchrony parameters
    B) SPECT parameters have superior repeatability
    C) A large phase SD in indicative of more synchronous LV function
    D) Dyssynchrony parameters are predictive of response to cardiac resynchronization therapy

17. Which statement is not true for myocardial perfusion PET agent:

A) Rb-82 does not require on-site cyclotron for its production
B) Maximum kinetic energy of positrons emitted during Rb-82 is greater than N-13 NH_3
C) Spatial resolution for N-13 NH_3 is poorer than Rb-82
D) F-18 FDG is not a myocardial perfusion agent

18. What is the maximum permissible radiation level at one metre from the patient who has been given high dose Iodine- 131 therapy:
    A) 0.5 µSv/hr   B) 5 µSv/hr   C) 25 µSv/hr   D) 50 µSv/hr

19. Hilson perfusion index is useful in evaluation of

A) PUJO   B) Transplant kidney
C) Renovascular hypertension   D) UTI

20. Mickey mouse sign, Lincoln sign and short pant sign on MDP bone scan is suggestive of :
    A) Fibrous dysplasia
    B) Hyperparathyroidism
    C) Pagets disease
    D) Caffeys disease

21. Dose Calibrator uses:
    A) Sodium Iodide doped with Thallium
    B) Gas filled detector
    C) Semiconductor detectors
    D) Barium flouride

22. Zevalin is indicated in
    A) Breast cancer
    B) Lung cancer
    C) Acute myeloid leukemia
    D) CD20 positive non Hodgkin lymphoma

23. I-131 MIBG therapy is indicated in all conditions except:

A) Metastatic /inoperable paraganglioma
B) Metastatic /inoperable pheochromocytoma
C) Metastatic /inoperable follicular thyroid carcinoma
D) Metastatic /inoperable medullary thyroid carcinoma

24. The most relevant indication for using adenosine as stress agent in gated myocardial perfusion imaging:

A) Systolic blood pressure at 150 mmHg
B) Patient having well-controlled wheeze with medication
C) Cardiac pacemaker
D) Female patient

25. The dosage of regadenosine for pharmacologic stress in myocardial perfusion scintigraphy:

A) 40 µgm bolus
B) 400 µgm bolus
C) 140 µgm/kg/min
D) 142 µgm bolus

26. In evaluation of LeVeen shunt, the radiopharmaceutical is administered:

A) By intravenous injection
B) By intraperitoneal injection
C) By subcutaneous injection
D) By intrathecal injection

27. If Tc-99m MDP prepared at 8:30 a.m. is 60mCi, how much would be there at 9:00 a.m. (λ=0.944)

A) 56.6mCi
B) 63.6mCi
C) 59.9mCi
D) 53.6mCi

28. Which statement is not true for F-18 Flurpiridaz:

A) Flurpiridaz binds to mitochondrial complex I
B) Has high first pass myocardial extraction fraction
C) Used as myocardial viability agent
D) Has shown higher sensitivity than the SPECT myocardial perfusion imaging

29. Which agent is not used for adrenal cortical imaging:

A) ^{131}I 6β-iodomethyl-19-norcholesterol (NP-59)
B) ^{75}Se-6-13-selenomethyl- 19-norcholesterol
C) ^{11}C-etiomidate
D) ^{123}I MIBG

30. Which one is a false statement for choline PET

    A) C-11 choline has low renal excretion
    B) Salivary glands do not show the physiological distribution of tracer
    C) Choline has shown promising result in parathyroid adenoma detection
    D) Choline uptake in tumour is due to up-regulation of choline kinase in tumour

31. Radioactive iodine (I-131) is used as therapeutic radionuclide agent except:

    A) Graves' disease
    B) Autonomous functioning thyroid nodule
    C) Differentiated thyroid cancer post-surgery
    D) Medullary thyroid cancer post-surgery

32. Which is the false statement regarding Tc-99m DMSA renal scan:

    A) Useful in locating the ectopic kidney
    B) Provides information regarding differential function of both kidneys
    C) Can differentiate between non-obstructive and obstructive drainage system
    D) Pyelonephritic changes/ renal cortical scars can be appreciated in the scan

33. Presence of 14 µg Al^{3+} (Aluminium) in 1 ml of ^{99m}Tc eluate signify:

    A) Chemical impurity
    B) Radionuclide impurity
    C) Radiochemical impurity
    D) Acceptable since Al^{3+} is less than 15 µg/ml of ^{99m}Tc eluate

34. Majority of MAA particles' size in correctly prepared ^{99m}TC-MAA radiopharmaceutical would be:

    A) 0.1-0.3 µm   B) 1-3 µm   C) 10-30 µm   D) 10-30 mm

35. If gastric activity is noticed during the GI bleed study being done with Tc-99m labelled red blood cells probably due to free pertechnetate. What should be the next step:

    A) Reimage the patient in erect position
    B) Image the patient's thyroid gland
    C) Patient is asked to drink water before reimaging
    D) Ask the patient to void before reimaging

36. For determination of plasma volume, 10 µCi of radiolabelled human serum albumin in 2.5ml is added to 500 ml of water. What is the concentration of the resulting solution:

    A) 0.020 µCi/ml   B) 0.019 µCi/ml
    C) 0.20 µCi/ml   D) 0.19 µCi/ml

37. The most effective mean of measuring low levels of removable radiation:

    A) By performing a wipe test
    B) By performing area survey
    C) Pocket dosimeter
    D) Use of thermo-luminescent dosimeter (TLD)

38. If the dose rate at 1 meter from a radioactive source is 100mrem/hour, what will be the dose rate at 2 meters:

    A) 6.25 mR/hr   B) 12.5 mR/hr   C) 25 mR/hr   D) 50 mR/hr

39. A lactating female undergoing ^{18}F-FDG PET/CT may resume breast feeding after:

    A) 4 hours   B) 24 hours
    C) One week   D) Discontinue the breast feeding

40. Minimum number of counts obtained in a uniformity correction flood for a SPECT camera:

    A) 1 million counts   B) 10 million counts
    C) 30 million counts   D) 60 million counts

41. The glove phenomenon seen after radionuclide administration is because of:

    A) Antecubital injection   B) Arterial injection
    C) Subcutaneous injection   D) Reactive arthritis

42. Radiopharmaceutical agent that crosses the intact blood brain barrier:

    A) ^{99m}Tc-DTPA   B) ^{99m}Tc-pertechnetate
    C) ^{99m}Tc-HMPAO   D) ^{99m}Tc-pertechnetate

43. A patient with enlarged left atrium underwent radionuclide ventriculography (MUGA) study. The region of interest for LVEF calculation includes some activity from left atrium. The resultant LVEF will be:

    A) Falsely lowered
    B) Falsely elevated
    C) Unchanged
    D) Cannot be determined from the information given

44. In dual isotope myocardial perfusion rest/stress study, which isotope should be injected first:

    A) Tc-99m
    B) Tl-201
    C) Does not matter which is injected first, though Tc-99m is used for the stress study
    D) Either can be injected first without any consequence

45. Method of localization of radiopharmaceutical for a perfusion lung study:

A) Active transport B) Capillary blockade
C) Sequestration D) Compartmental containment

46. If tracer activity is seen in the liver on lung ventilation scan, this indicates:

A) Incorrect particle size
B) Study was performed with ^{99m}Tc- DTPA
C) Study was performed with ^{133}Xe
D) Contaminated aerosol delivery system

47. Which study does not involve the use of radiolabeled RBCs:

A) Meckel's diverticulum B) GI bleed imaging
C) Spleen imaging D) Blood pool imaging of liver

48. If gall bladder activity is noted on a normal renal scan, it indicates that scan was performed using:

A) ^{99m}Tc-DTPA B) ^{99m}Tc-MAG$_3$ C) ^{99m}Tc-DMSA D) ^{99m}Tc-GHA

49. The isotope used in urea breath testing for H pylori:

A) Co-57 B) C-12 C) C-14 D) Cr-51

50. A lead vial shield holding the iodine is 6 mm thick, what percentage of the original exposure rate will remain (HVL of lead for iodine-131 is 3 mm):

A) 12.5% B) 25% C) 50% D) 75%

x-x-x

Philosophy (Ph.D. & M.Phil.)   (1077)

1.   Who has written, Concept of Mind from the following

      A) Gilbert Ryle   B) Kant   C) Plato   D) Aristotle

2.   Who was amongst following made a dictum : 'Esse est percipi'

      A) Locke   B) Plato   C) Berkeley   D) Hume

3.   Gotha program is written by

      A) Marx   B) Mao   C) Plato   D)Aristotle

4.   'Real is rational and rational is real' statement given by

      A) Hegel   B) Kant   C) Locke   D) Derrida

5.   'Being and Nothingness' is a book written by

      A) Levinas   B) Locan   C) Derrida   D) Sartre

6.   " Man is measure of all things" is a statement given by

      A) Sartre   B) Marx   C) Protagoras   D) Kant

7.   Who has coined the concept of 'pre-established harmony" amongst following Philosophers?

      A) Plato   B) Descartes   C) Kant   D) Leibniz

8.   'Revolution is midwife of social change' is a theory propounded by

      A) Plato   B) Aristotle   C) Marx   D) Lenin

9.   'Phenomena of Perception' is a book written by

      A) Karl Jasper   B) Merleau- Ponty   C) Heidegger   D) Kant

10.   "Ghost in Machine" is a concept provided by

      A) Gilbert Ryle   B) Hobbes   C) Davidson   D) Derrida

11.   'You cannot step into the same river twice" is a concept propounded by

      A) Descartes   B) Spinoza   C) Kant   D) Heraclitus

12.   Descartes gives ……..of existence of God

      A) Causal proof   B) Cosmological

      C) Non-causal proof   D) Ontological proof

13. Spinoza was regarded as

A) Pantheist   B) Monotheist   C) Empiricist   D) Idealist

14. Timaeus is a dialogue written by

A) Derrida   B) Plato   C) Aristotle   D) Sartre

15. According to Kant , Moral is

A) A priori based on reason

B) A priori not based on reason

C) A posteorioari and not based on reason

D) A posteoriorari and based on reason

16. "Commitment is to act not a word"- this statement refers to

A) Marx   B) Lenin   C) Mao   D) Sartre

17. Science of Logic is a book by

A) Spencer   B) Plato   C) Hegel   D) Hobbes

18. "Family resemblances" is a concept refers to

A) Plato   B) Aristotle   C) Chomsky   D) Wittgenstein

19. The crisis of European Science and transcendental philosophy is book by

A) Bertrand Russell   B) Aristotle   C) Husserl   D) Marx

20. "Culture and Value" is a book by

A) Plato   B) Aristotle   C) Wittgenstein   D) Heraclites

21. "Margins of Philosophy "is an important book written by

A) Plato   B) Derrida   C) Kant   D) G.E. Moore

22. *Of Being and Essence* is a book written by

A) Plato   B) Thomas Aquinas   C) Marx   D) Heraclites

23. *On way to Language* is a book written by

A) Plato   B) Heidegger   C) Hegel   D) Kant

24. Which among the following theories of causation accepted Samkhaya philosophy

A) Asatkarvada B) Satkarvada   C) Arambhavada   D)None of these

25.   "Purusa is regarded as what?

A) Consciousness   B) Pure consciousness

C) Unconscious   D) Sub-conscious

26.   Which among the following knowledge is Prama ?

A) Pratyakshya B) Tarka   C) Samsya   D) Bhrama

27.   Anekantvada is concept refers to

A) Buddhism   B) Jainism   C) Vedanta   D) Carvaka

28.   Nyaya theory of knowledge can be kept under

A) Idealism   B) Realism   C) Pragmatism D) Critical realism

29.   Who had invented the concept of Anupalabhdi

A) Kumarila   B) Panini   C) Nagarjuna   D) Vatssayan

30.   Who has invented the concept of bio-politics?

A) Wittgenstein B) Berkley   C) Foucault   D) G E Moore

31.   The Relevance of Beautiful and Other essays is book written by

A) Kant   B) Hume   C) Berkeley   D) Gadamer

32.   "Making itself intelligible is suicide for philosophy" – a statement refers to

A) Kant   B) Heidegger   C) Hegel   D) Marx

33.   *Ksanabhangavada is a*

A) Buddhista theory   B) Jainist   C) Vedanatic   D) Samkhaya

34.   Who is known as prachhanya Budha

A) Mahavira   B) Ramanuja   C) Sankara   D) Patanjali

35.   The term "Cogito eargo sum" is term used by

A) Husserl   B) Kant   C) Descartres   D) J.H. Lambert

36.   *The order of Things* is a book written by

A) Franz Brentano   B) Foucault   C) Karl Marx   D) Hegel

37.   The Natya Shastra is book of rasa theory and drama composedby

A) Abhinavgupta   B) Kumarla   C) Nagarjuna   D) Panini

38. "The Human body is the best picture of the human soul" is a statement refers to

   A) Wittgenstein   B) Habermas   C) Charles Taylor   D) Russell

39. *The Ethics of authenticity* is a book written by

   A) Michel Foucault   B) Habermas   C) Charles Taylor   D) Aristotle

40. The Adventure of Dialectic is a critical writing refers to

   A) Merleau-Ponty   B) Hegel   C) Husserl   D) Habermas

41. *Mulamadhayamkarika* is a book composed by

   A) Nagarjuna   B) Sankara   C) Ramanuja   D) Vallabhacharya

42. *Aristotle has written the following a book where he discusses the concept of friendship*

   A) Politics   B) Nichomachean ethics

   C) Republic   D) Apology

43. *Lokayata* is a concept finds meaning in following systems of Indian Philosoiphy

   A) Buddhism   B) Nyaya- Vaiseshika

   C) Vedanta   D) Carvaka

44. The only true wisdom is knowing that you know nothing is a statement by

   A) Plato   B) Socrates   C) Sartre   D) Marx

45. *'Happiness is pretty thing to feel but very dry to talk about'*, is a hedonistic ethical principle, refers to

   A) Bentham   B) J.S. Mill   C) Sidgwick   D) Locke

46. *Vipraya* is concept refers to

   A) Wrong cognition   B) Right cognition

   C) Neither right nor wrong   D) None of these

47. *Dandaniti a* is philosophical text written by

   A) Kautilya   B) Vyasa   C) Radhakrishnan   D) Sankara

48. Philosophical Hermeneutics is a book written by

   A) Marx   B) Spinoza   C) Gadamer   D) Ramanuja

49. Philosophy and the Mirror of Nature is book by

   A) Thomas Kuhn   B) Rorty   C) Hegel   D) Marcuse

50. Existence precedes Essence is a statement means

A) I think , therefore, I am   B) I exist , therefore, I think

C) Both A and B are correct   D) None of these

x-x-x

Physical Education(Ph.D. & M.Phil.)   (1077)

1. Our hypothalamus begins to lose its ability to regulate body temperature when it (the temperature) rises above

   A) 104∘ F   B) 105∘ F   C) 106∘ F   D) 107∘ F

2. Name the gene which causes the back pain

   A) Actin 3   B) Actin 9   C) Park 2   D) Actin A

3. In which of the following substances is haemoglobin very rich?

   A) Calcium   B) Magnesium   C) Potassium   D) Iron

4. If ill-planned, circuit training could lead to muscle.

   A) Decay   B) Atrophy   C) Weakness   D) Staleness

5. Which of the following track events is not slotted in Heptathlon?

   A) 100m hurdles B) High jump   C) Javelin throw   D) 100m sprint

6. Most events allow athletes to wear spiked footwear with up to,

   A) Seven spikes   B) Nine spikes   C) Thirteen spikes   D) Eleven spikes

7. How much blood does a trained athletic heart pump out in one minute?

   A) 10.2 litres   B) 15 litres   C) 18 litres   D) 22 litres

8. Historical research is also known as

   A) Biographical research   B) Demographic research
   C) Retrospective research   D) Introspective research

9. When a population is stratified the units within each stratum are, more or less,

   A) Numerically the same   B) Characteristically different
   C) Similar to that of the entire population D) Homogenous

10. The Achilles tendon is the tapering part of

   A) Gluteus maximus   B) Gastrocnemius
   C) Quadriceps   D) Hamstring

11. Which of the following games is also known as ping pong?

   A) Badminton   B) Lawn tennis   C) Table tennis   D) Bowling

12. Much of the history of physical education in ancient India can be known from the study of
   A) The Vedas
   B) The Upnishads
   C) The Hindu Epics (Ramanayana& Mahabharata)
   D) Travelogues of foreigners

13. The number of movements possible in our spine are

    A) Two   B) Four   C) Six   D) Just one

14. The class 1 lever is built for

    A) Speed   B) Equilibrium   C) Strength   D) Range of motion

15. All sensory impulses are received from the sensory organs first at the level of

    A) Sympathetic system   B) Spinal cord

    C) Brain stem   D) Hypothalamus

16. In what ratio is the presence of testosterone to epitestosterone in the urine of a competitor constitutes an offence in normal circumstances?

    A) 6:1   B) 7:1   C) 8:1   D) 9:1

17. How many times more energy is released during oxidative process, then released during anaerobic glycolysis?

    A) 15 times   B) 18 times   C) 21 times   D) 12 times

18. How many types of kapalbhatikriya are there

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

19. Which asana is not good for high blood pressure

    A) Vajra asana   B) Shav asana   C) Setubandh asana   D) Shirsh asana

20. Sigmund Freud is also known to the father of

    A) Theory of psychoanalysis   B) Theory of motivation

    C) Theory of connectionism   D) Theory of parallelism

21. The first book of psychology was written by

    A) Kohler   B) Wrlliam James   C) Clark Hull   D) Plato

22. Face validity refers which of the following.

    A) Facial expression is used to make a diagnose

    B) The scale of emotional responding

    C) The notion that an assessment method may appear to be valid simply because it has questions which intuitively measure seem relevant to the trait or characteristic being measured

    D) A construct is a hypothetical or inferred attribute that may not be directly observable or directly measurable

23. BMI (Body mass index) is given by:

    A. $\dfrac{\text{Wt in Kg}}{\text{Ht}^2 \text{ m}}$

    B. $\dfrac{\text{WtinIbs}}{\text{Ht}^2 \text{ in}}$

    C. $\dfrac{\text{Ht}^2 \text{ m}}{\text{Wt in Kg}}$

    D. $\dfrac{\text{Ht}^2 \text{ in}}{\text{Wt in Ibs}}$

24. Somatotyping profile of (4,4,1) is considered as.

    A) Endomorph Mesomorph   B) Endomorphic Mesomorph

    C) Balanced Mesomorph   D) Mesomorphic Endomorph

25. In November 2011 the International Association of Athletics Federations (IAAF) awarded Sally Pearson as the 2011 Female Athlete of the Year. She is the first person from her country to receive this award. She belongs to which among the following countries?

    A) New Zealand   B) Australia

    C) Canada   D) Austria

26. Which company is the official tennis ball supplier to Wimbeldon.

    A) Nike   B) ZEBCO   C) Slazenger   D) SIS

27. 'Synthetic track' in athletics was used for the first time in

    A) 1968 (Mexico Olympics)   B) 1948 (London Olympics)

    C) 1896 (Athens Olympics)   D) 1996 (Atlanta Olympics)

28. Which delegates conduct the gender test

    A) Medical delegates   B) Technical delegates

    C) Doping control delegates   D) Official surveyor

29. Which one of the following is a relative measure of dispersion

    A) Standard deviation   B) Variance

    C) Co-efficient of variance   D) None of these

30. Coefficient of correlation will be always

    A) More than 0   B) More than-1

    C) Less than-1   D) Between -1 and =1

31. Incorrectly rejecting a true null hypothesis is an example of what?

    A) Significance testing   B) Type II error

    C) Type I error   D) Participant bias

32. What statistical test would be used with interval or ration data with multiple dependent variables?

    A) Repeated measure ANOVA   B) MANOVA

    C) Independent t-test   D) Mixed ANOVA

33. Which of the following is known as the building blocks of the body?

    A) Proteins   B) Carbohydrates

    C) Vitamins   D) Minerals

34. In a gait cycle of walking the ratio of stance phase two swing phase is approximately

    A) 60:40   B) 50:50   C) 40:60   D) 70:30

35. Basically a problem of the nature of truth is discussed under:

    A) Ethics   B) Axiology   C) Law   D) Epistemology

36. The contractile unit of skeletal muscle is:

    A) Sarcomere   B) Actin & Myosin

    C) Z-line   D) Myofibril

37. Night blindness is caused due to deficiency of:

    A) Vitamin D   B) Vitamin A   C) Vitamin E   D) Vitamin C

38. Two major branches of mechanics are:

    A) Dynamics and Kinetics   B) Kinetics and Kinematics

    C) Kinematics and Statics   D) Statics and Dynamics

39. Full form of URL is?

    A) Uniform Resource Link   B) Uniform Registered Link

    C) Uniform Resource Locator   D) Unified Resource Link

40. Introspection as a method stands rejected by

    A) Functional school   B) Behaviourists

    C) Psychoanalysts   D) Gesralt

41. Floppy disks which are made from flexible plastic material are also called?

    A) Hard disks   B) High-density disks

    C) Diskettes   D) Templates

42. Which of the following team sports has the highest incidence of injuries during games?

    A) Soccer   B) Team handball   C)Volleyball   D) Basketball

43. The data recording format in most of the modern magnetic tape

    A) 7-bit ASCII   B) 7-bit EBCDIC C) 8-bit ASCII   D) 8-bit EBCDIC

44. In which year was the first World Cup Hockey tournament held?

    A) 1970   B) 1971   C) 1972   D) 1973

45. As adults age, it is typical for lean body or muscle mass to

    A) Increase or decrease   B) Stay the same

    C) Increase   D) Decrease

46. The gold standard for measuring body composition is

    A) Underweight weighing   B) Skinfold test

    C) Body mass index   D) Weight

47. A reduction of 500 calories per day would lead to a weekly weight loss of:

    A) 0.5 kg   B) 1 kg   C) 1.5 kg   D) 2 kg

48. High blood sugar level is controlled by:

    A) Glucose   B) Thyroxin   C) Insulin   D) Adrenalin

49. Ryder cup is related with which sports.

    A) Cricket   B) Football   C) Badminton   D) Golf

50. Incomplete recovery is vital in:

    A) Continuous method of training   B) Fartlek

    C) Interval training   D) Cross country

x-x-x

Physics (1077)

1. Two particles are said to be distinguishable when

   A) The average distance between them is large compared to their de Broglie wavelengths
   B) The average distance between them is small compared to their de Broglie wavelengths
   C) They have overlapping wave packets
   D) Their total wave function is symmetric under particle exchange

2. Bose-Einstein condensation temperature T_c refers to the temperature below which

   A) An assembly of Bose gas condenses to the liquid state
   B) There is an appreciable occupation of the ground state in an electron system
   C) There is a significantly large occupancy of the ground state in a system of bosons
   D) The bosons essentially behave like fermions

3. A system has N distinguishable particles. Each particle can occupy one of the two non-degenerate states with an energy difference of 0.1 eV. If the system is in thermal equilibrium at room temperature, the approximate fraction of particles in the higher-energy state is (k = 1.38 x 10^{-23} J/K and 1 eV = 1.6 x 10^{-19} J)

   A) e^{-10} B) e^{-4} C) e^{-2} D) zero

4. Consider an N-particle non-interacting system, with each particle having the following energy levels: $E = 0$ (non-degenerate) and $E = \Delta$ (doubly degenerate). The canonical partition function of the system is

   A) $2\, e^{-N\Delta/kT}$ B) $N\, e^{-2\Delta/kT}$ C) $[1 + 2\, e^{-\Delta/kT}]^N$ D) $N\,[1 + 2\, e^{-\Delta/kT}]$

5. 100 molecules of gas are enclosed in a cubical volume which is divided into two equal halves. The ratio of the time spent by the system in the most probable macrostate (50, 50) to that spend in the macrostate (45, 55) is

   A) 1.1   B) 1.64   C) 1.92   D) 2.33

6. Given that $L = \frac{1}{2}\dot{x}^2 - V(x)$. What is the x's conjugate momentum?

   A) $\frac{1}{2}m\dot{x}^2$ B) mx C) $m\dot{x}$ D) $-\frac{\partial V}{\partial x}$

7. If L is cyclic in q_j then

   A) P_j is not conserved   B) P_j is conserved
   C) q_j appears in Lagrangian   D) $\dot{q}_j$ does not appear in Lagrangian

8. Hamiltonian can be constructed from the formula
   A) $\dot{q}p - L$ B) $\dot{p}q - L$

   C) $H = \frac{\partial L}{\partial q}$ D) $H = L + \frac{d}{dt}F(q,t)$

9. Coriolis effect is about

A) A particle stationary in rotating frame of reference
B) A moving particle in rotating frame of reference
C) A moving particle in stationary frame of reference
D) None of the above

10. Infinitesimal rotations are

A) Scalar   B) Pseudoscalar   C) Vectors   D) Pseudovectors

11. Single layer Graphene is

A) Small band gap semiconductor   B) Is zero band gap semimetal
C) Large band gap semiconductor   D) Is an insulator

12. Density of states (DOS) in the case of one dimensional material is proportional to

A) $E^{1/2}$ B) E^0 C) $E^{-1/2}$ D) E

13. At low temperatures, the heat capacity of solids is proportional to

A) T B) T^2 C) T^3 D) T^{-1}

14. The doping levels of the n and p parts in the tunnel diode are

A) 1 in 10^3 B) 1 in 10^6 C) 1 in 10^9 D) 1 in 10^{11}

15. The band gap of spherical gold nanoparticles is

A) Zero   B) Smaller for smaller nanoparticles
C) Larger for larger nanoparticles   D) Larger for smaller nanoparticles

16. The value of $\int_{-\infty}^{\infty} \delta(x^2 - 9)\, x\, dx$ is
A) Zero   B)3   C) 2   D) 9

17. An electron in hydrogen atom is in superposition state given by the wave function
$$\psi(r) = A\,[\,4\,\psi_{100}(r) - 2\,\psi_{211}(r) + \sqrt{6}\,\psi_{200}(r) - \sqrt{10}\,\psi_{2,1,-1}(r)]$$
The normalization constant A is

A) 1/12   B) 1/3   C) 1/6   D) 1

18. Two coherent light sources of intensities, I and 9I are used in an interference experiment. The resultant intensities at points where the waves from the two sources superpose with a phase difference of π is

A) 8 I   B) $(10 + 3\sqrt{3})$ C) 4 I   D) 10 I

19. Which of the following is an eigen-state of linear momentum operator?

A) A Sin (Kx)

B) A Cos (Kx)

C) A exp(i K x)

D) A [Sin (Kx) + Cos(Kx)]

20. The ratio of electrical conductivity σ to thermal conductivity κ is proportional to temperature T. According to Wiedemann – Franz law, the ratio σ/ κT

A) Change slowly with temperature and is called Debye constant
B) Varies from metal to metal.
C) Is a constant called the Landau ratio
D) Is the same for all metals, and is called the Lorentz number

21. For Bragg Reflections from a set of parallel adjacent planes separated by d, the wavelength of x-rays must be

A) Less than d.
B) Greater than d.
C) Less than or equal to 2d.
D) Greater than or equal to 2d.

22. Which of the following results does not hold good for the matrices

$$A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, B = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix}, C = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \quad ?$$

A) $A^2 = B^2$

B) $C^2 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

C) $AB - BA = 0$

D) $BC + CB = 0$

23. The differential equation $\left(1 - x^2\right)\dfrac{d^2 y}{dx^2} - x\dfrac{dy}{dx} + y = 0$ has regular singularities only at

A) $x = 0$, -1

B) $x = $ -1, +1

C) $x = 0, \pm 1$

D) $x = \pm 1, \infty$

24. If Fourier transform of $f(x)$ is $g(k)$, then that of $xf(x)$ will be

A) $i\dfrac{dg}{dk}$

B) $-i\dfrac{dg}{dk}$

C) $kg(k)$

D) $-kg(k)$

25. The addition of angular momenta $j_1 = 3$ and $j_2 = 2$ will result in 35 states of which the number of linearly independent states with magnetic quantum number m=3 is

A) 10

B) 6

C) 2

D) 3

26. The exciting line in a Raman spectroscopy experiment is at 5000 Å and the observed Stokes line is at 5100 Å. The wavelength of anti-Stokes line is

   A) 4900 Å   B) 5200 Å   C) 4800 Å   D) 5000 Å

27. Natural shape of the energy distribution in an atomic transition is

   A) Gaussian   B) Lorenzian   C) Maxwellian   D) Poisson

28. In SiO_2 optical fibre generally used for communication purposes, the preferred wavelength used is

   A) 630 nm   B) 540 nm   C) 1550 nm   D) 400 nm

29. If error in a measured variable X is ΔX, the error in the Log_e X will be

   A) $\Delta X/X$ B) $Log_e (\Delta X)/X$ C) $Log_e (\Delta X)$ D) $X Log_e (\Delta X)$

30. Vacuum of the order of 10^{-6} torr can be produced and measured using

   A) Rotary pump and pirani gauge, respectively
   B) Diffusion pump and pirani gauge, respectively
   C) Diffusion pump and penning gauge, respectively
   D) Adsorption pump and thermocouple gauge, respectively

31. Phonons propagate in a solid with

   A) Velocity of light
   B) Velocity of sound
   C) Root mean square velocity of the atoms in the solid
   D) Fermi velocity

32. Cholesteric, Smectic and Nematic are types of

   A) Polymers   B) Nano-materials
   C) Liquid crystals   D) Superconductors

33. A charged particle is moving in a uniform magnetic field $\vec{B}$ with the plane of its trajectory normal to $\vec{B}$. If it loses kinetic energy continuously, its trajectory is

   A) Helical   B) Circular   C) Spiraling inwards   D) Spiraling outwards

34. Thermal conduction in metals accomplished by the crystal lattice is substantially

   A) Less than the electron conduction
   B) More than the electron conduction
   C) Equal to the electron conduction
   D) There is no relation with electron conduction

35. The London Penetration depth is given by

A) $\lambda = \left[\dfrac{m}{n_s \mu_0 e^2}\right]^{\frac{1}{2}}$

B) $\lambda = [n_s/(m\mu_0 e^2)]^{1/2}$

C) $\lambda = [mn_s \mu_0 e^2]^{1/2}$

D) None of these

36. A ferromagnetic material has a Curie temperature 100 K. Then

A) All the atomic magnets in it get oriented in the same direction below 100 K
B) The plot of inverse susceptibility versus temperature is linear with a slope T_C
C) The plot of its susceptibility versus temperature is linear with an intercept T_C
D) All the atomic magnets in it get oriented in the same direction above 100K

37. According to quantum mechanics, the lowest energy state of a particle in a box of finite length "L"has an energy of

A) $\dfrac{h}{8mL^2}$

B) $\dfrac{h^2}{8mL^2}$

C) $\dfrac{h^2}{8mL}$

D) $\dfrac{h^2}{8m^2 L^2}$

38. A metallic wire of length "L" and area of cross-section "S" has resistance "R". The wire is cut into four equal pieces by its length. Then, these four pieces are connected in parallel by joining their ends. The effective resistance of the resulting network will be

A) R/4

B) R/8

C) R/12

D) R/16

39. The output of a NOR gate is HIGH if

A) All inputs are HIGH

B) Any inputs are HIGH

C) All inputs are LOW

D) Any inputs are LOW

40. The relation between β and α is (β and α are current gains in common emitter and common base transistors)

A) β = 1 / (1 – α)

B) β = (1 – α) / α

C) β = α / (1 – α)

D) β = α / (1 + α)

41. In the following circuit diagram, the resistance R_2 is doubled, then the current through R_2
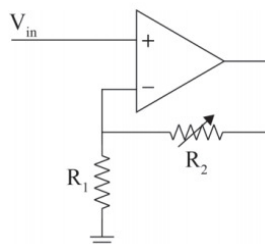
A) Remains the same

B) Is doubled

C) Is halved

D) Is quadrupled

42. Entropy change depends upon

    A) Mass transfer   B) Heat transfer

    C) Change of temperature   D) Change of pressure

43. A point charge is present at a corner of a cube, as shown in the figure.
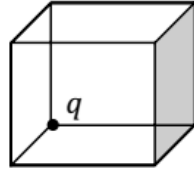
    The flux of the electric field vector through the shaded side is

    A) $q/8\epsilon_0$ B) $q/4\epsilon_0$ C) $q/16\epsilon_0$ D) $q/24\epsilon_0$

44. The mass defect is zero of

    A) ^{11}C B) ^{12}C C) ^{15}N D) ^{17}O

45. Atomic mass number of an element is 232 and its atomic number is 90. The end product of this radioactive element is an isotope of lead (Atomic mass number = 208 and atomic number= 82). The number of alpha and beta particles emitted are

    A) Alpha particles = 6, and beta particles = 0
    B) Alpha particles = 6, and beta particles = 4
    C) Alpha particles = 4, and beta particles = 6
    D) Alpha particles = 3, and beta particles = 3

46. The mass of a moving particles is $\dfrac{2m_\circ}{\sqrt{3}}$, where $m_\circ$ is its rest mass. The linear momentum of the particle is

    A) $2m_\circ c$ B) $\dfrac{2m_\circ}{\sqrt{3}}c$ C) $m_\circ c$ D) $\dfrac{m_\circ}{\sqrt{3}}c$

47. The mean distance of Mars from Sun being 1.5 times that of Earth approximately, the time of revolution of Mars about Sun would be

    A) 1 year   B) 10.24 years   C) 1.837 years   D) 18.37 years

48. The equation *curl* $H = \epsilon\dfrac{\partial E}{\partial t}$ is valid in

    A) Dielectrics in the presence of steady state current
    B) Dielectrics when current is zero
    C) Dielectrics in the presence of time varying current
    D) Only conducting medium

49. An electron and proton have kinetic energy of 1keV each. The ratio of their de-Broglie wavelengths is approximately ($m_e/m_p \sim 1/1860$; where m_e and m_p are the masses of electron and proton respectively)

A) 1   B) 43   C) 930   D) 1860

50. The unit of diffusion coefficient is

A) cm/s   B) cm/s^2 C) cm^2/s   D) cm^2/s^2

x-x-x

Political Science (1077)

1. The book 'The Indian Constitution: Cornerstone of a Nation' is written by

   A) Granville Austin   B) Rajni Kothari   C) B.R. Ambedkar   D) D.D. Basu

2. The author of the book "State against Democracy" is

   A) Rosa Luxemburg   B) Lech Walesa C) William Godwin   D) Rajni Kothari

3. The author of the book 'Democracy and Discontent: India's Growing Crisis of Governability' is

   A) Ashutosh Varshney   B) Atul Kohli
   C) Partha Chatterjee   D) Niraja Gopal Jayal

4. The author of the book 'In Pursuit of Lakshmi: Political Economy of Indian State' is

   A) Rudolph and Rudolph   B) Francine Frankel
   C) Pranab Bardhan   D) Rob Jenkins

5. Articles 17 and 18 of Indian Constitution provide

   A) Economic equality   B) Social equality   C) Political equality   D) Religious equality

6. The Constitution of India defines India as

   A) Quasi-federal state   B) Union of States
   C) Unitary State   D) Federation of states

7. The amendment to the Indian Constitution which gave precedence to Directive principles over fundamental rights is

   A) 35th B) 42nd C) 50th D) 51st

8. All India Muslim Leaguewas established in

   A) 1896   B) 1906   C) 1916   D) 1926

9. The Chauri Chaura incident was related to

   A) Non-Cooperation Movement   B) Quit India Movement
   C) Civil Disobedience Movement   D) Ghadar movement

10. The first state reorganized in India on linguistic basis was

    A) Andhra Pradesh B) Maharashtra C) Gujarat   D) Tamil Nadu

11. The first non-Congress Prime Minister of India was

    A) Gulzarilal Nanda   B) Morarji Desai   C) Charan Singh   D) VP Singh

12. The Kargil conflict took place in

    A) 1995   B) 1999   C) 2003   D) 2007

13. The DSSSS was a precursor of

    A) BSP   B) SP   C) JD   D) RJD

14. The terrorist attack in Mumbai took place in

    A) 2001   B) 2005   C) 2008   D) 2011

15. MedhaPatkar is best known as

    A) An environmentalist   B) A feminist activist
    C) A human rights activist   D) An author

16. Left Front government has ruled

    A) Tripura   B) Nagaland   C) Arunachal Pradesh   D) Mizoram

17. Arthshastra was composed approximately

    A) 1000-1500 year ago   B) 1500-2000 year ago
    C) 2000-2500 years ago   D) 3000-3500 years ago

18. Raja Ram Mohan Roy was the founder of

    A) Brahmo Samaj   B) Arya Samaj   C) Sant Samaj   D) Vishwa Bharati
19. The statement "Swaraj is my birth right and I shall have it" is associated with

    A) Moti Lal Nehru   B) Gopal Krishan Gokhale
    C) Bal Gangadhar Tilak   D) Swami Vivekanand

20. The book Glimpses of World History was written by

A) Rabindranath Tagore   B) Sarojini Naidu
C) Dadabhai Naroji   D) Jawaharlal Nehru

21. The concept of Total Revolution was given by

A) M.N. Roy   B) Kanu Sanyal
C) Jayaprakash Narayan   D) Ram Manohar Lohia

22. The slogan of 'Jai Jawan Jai Kisan' was given by

A) Lal Bahadur Shastri   B) Narendra Modi
C) Charan Singh   D) Indira Gandhi

23. Some consider the name 'United Nations' a misnomer because

A) Nations are never united   B) It has different categories of nations
C) Its members are states rather than nations   D) Its membership is voluntary

24. Climate change is a potential threat to global security because

A) It could tensions between developed and developing states
B) It could lead to the mass movement of refugees from areas which are no longer inhabitable.
C) Shortages of vital resources like food and water may give rise to conflict.
D) All of the above

25. The Bretton Woods agreement

A) Resolved to save the rainforests
B) Established the World Wildlife Fund
C) Drove a wedge between First World and Third World
D) Led to the establishment of the International Monetary Fund (IMF).

26. Which of the following was not a member of Axis Powers during the Second World War?

A) Germany   B) Japan   C) Italy   D) USSR

27. Which of the following states was not a member of the League of Nations?

A) India   B) China   C) USSR   D) USA

28. SEATO was formed in

   A) 1949   B) 1954   C) 1962   D) 1973

29. The CMEA was an economic organization of

   A) Socialist states   B)Newly independent states
   C) East Asian states   D) Mediterranean states

30. Which of the following countries is no longer communist?

   A) China   B) Cuba   C) Vietnam   D) Poland

31. ISIS stands for:

   A) Islamic State of Iraq and Syria   B) Islamic State of Iran and Syria
   C) Islamic Solidarity of Iraq and Syria   D) Islamic Solidarity of Iraq and Sudan

32. Paris Agreement of 2015 was about

   A) Economic Development   B) Environment
   C) Peace   D) Gender Justice

33. The WTO has its headquarters in

   A) Washington   B) Geneva   C) Paris   D) Brussels

34. Which of the following IR scholars is not associated with idea of 'complex interdependence'?

   A) Joseph Nye   B) Robert Keohane   C) Richard N. Cooper   D) Kenneth Waltz

35. Which of the following IR scholars is not associated Neorealism?

   A) Kenneth Waltz B) John Mearheimer   C) Henry Kissinger   D) Robert Jervis

36. Game theory in IR assumes

   A) Rational choice behavior from actors
   B) Impulsive choice behavior from actors
   C) Culturally Conditioned response from actors
   D) None of the above

37. Which of the following books is not written by Plato?

   A) Republic   B) Laws   C) Statesman   D) Politics

38. Who wrote the book 'The City of God'?

   A) St. Augustine   B) Thomas Aquinas   C) Francis of Assisi   D) Dante

39. Who wrote 'Discourses on Livy'?

   A) Machiavelli   B) Hobbes   C) Aristotle   D) Rousseau

40. Who wrote 'Theories of Surplus Value'?

   A) Marx   B) Lenin   C) Gramsci   D) Mao

41. Who wrote 'One Dimensional Man'?

   A) Marcuse   B) Adorno   C) Habermas   D) Freud

42. Who made the distinction between negative and positive liberty?

   A) Hannah Arendt B) Harold Laski C) Bertrand Russell   D) Isaiah Berlin

43. Right to Form Association is a

   A) Political Right   B) Natural Right   C) Civil Right   D) Legal Right

44. The legal theory of Rights holds that
   A) Rights are given by nature   B) Rights are granted by the state
   C) Rights are created by the social custom   D) The rights are global

45. Affirmative Action is related to providing

   A) Formal equality   B) Equality of opportunity
   C) Equality of outcome   D) Abolition of privileges

46. The conventional theory of state sovereignty holds that

    A) There ought to be a single source of ultimate state power.
    B) Monarchy is natural form of government
    C) Will of state is always higher than will of the people
    D) There are no limits to political obligation towards the state

47. Orientalismis a term that designates

    A) Uniqueness of Oriental culture
    B) Superiority of Oriental culture over Continental culture
    C) Superiority of Continental culture over Oriental culture
    D) European tendency to view Continent-Orient relationship in 'self and other' mode.

48. A key figure in the development of pluralism is

    A) C. Wright Mills B) Roald Dahl C) James Burnham   D) Robert Dahl.

49. 'Iron Law of Oligarchy' is attributed most to

    A) Robert Michels B) JK Galraith   C) Pareto   D) Mosca

50. Which of the following thinkers took a totally negative view of civil society?

    A) Hegel   B) Marx   C) Gramsci   D) Habermas

x-x-x

Police Administration(M.Phil. & Ph.D.)

1. Which of the following report of Second Administrative Reforms Commission deals with the public order?
   A) Fourth Report   B) Fifth Report   C) Eight Report   D) Sixth Report

2. What does 'RAW' stands for:
   A) Research for Analytics Wing   B) Research and Analysis Wing
   C) Research and Work   D) Rapid Action Wing

3. The rank of Deputy Superintendent of Police (DSP) in India was established on the recommendations of:
   A) Dharamvir Commission   B) Indian Police Commission , 1902
   C) Indian Police Act, 1861   D) Non of the above

4. Which article of the constitution authorizes the Central Government to intervene in the law and order problems of the State?
   A) Article 352   B) Article 358   C) Article 355   D) Article 365

5. Police Commissionrate System was recommended for cities in India having population:
   A) 5 lakhs and above   B) 10 lakhs and above
   C) 12 lakhs and above   D) 15 lakhs and above

6. Government of India appointed National Police Commission on:
   A) November 15, 1977   B) September 25, 1976
   C) December 18, 1971   D) October 15, 1977

7. 'NCRB' stands for:
   A) National Crime Report Bureau   B) National Crime Record Bureau
   C) National Criminal Reporting Bureau D) National Criminal Releasing Bureau

8. 'Coban' is a community policing initiative implemented in:
   A) China   B) South Korea   C) America   D) Japan

9. 'CHRI' stands for:
   A) Chandigarh Human Rights Initiative   B) Commonwealth Human Rights Initiative
   C) Chicago Human Relations Institute   D) California Human Relations Initiative

10. Who gave the Differential Association Theory on Criminology?
    A) Cesare Beccaria   B) Jeremy Bentham
    C) Edwin H. Sutherland   D) Raffaele Garofalo

11. Who has described organized crime as, "an enterprise organized for the purpose of making economic gain through illegal activities":
    A) Gordon Hawkins   B) Thorsten Sellin   C) Caldwell, R.G.   D) Beeker Howard

12. In India, to be eligible for parole, a prisoner must have:
   A) served at least half of the sentence of the total term of imprisonment
   B) served at least one-third of the sentence of the total term of imprisonment
   C) served at least one fourth of the sentence of the total term of imprisonment
   D) There is no such condition for release of the prisoner on parole.

13. Who defined white collar as a "Crime committed by persons of respectability and high social status in course of their occupation":
   A) Bailey D.H.   B) Cesare Beccaria
   C) Edwin H. Sutherland   D)Walter Reckless

14. The structure of DNA molecule is:
   A) Single Helix   B) Double Helix   C) Triple Helix   D) None of these

15. Which of the following is a rave drug?
   A) Opium   B) Diazepam   C) Codeine   D) Amphetamine

16. In case of an injury by fire-arm:
   A) An entry hole is bigger than the exit hole
   B) An exit hole is bigger than the entry hole
   C) Both entry and exit holes are equal
   D) Entry and exit holes cannot be distinguished

17. The individuality of a fingerprint is determined by:
   A) Type of pattern on the fingerprint
   B) Type, size, shape and position of the ridge characteristics (minutiae)
   C) The size of the fingerprint pattern
   D) Ridge count of the pattern

18. The clothes bearing liquid blood stains:
   A) Are first washed and then sent to the laboratory for analysis
   B) Are first dried in shade before packing
   C) Are dried with the help of a drier before packing
   D) None of the above

19. Which of the following is Correct regarding 'Furlough':
   A) It is a matter of right of a prisoner
   B) It is granted to a prisoner periodically
   C) It is granted to a prisoner without stating any particular reason
   D) All the above

20. Abettor is a person:
   A) Who commits the offence   B) Who instigates the commission of offence
   C) Against whom the offence is committed   D) Who is innocent

(2)

21. Under the Probation of Offenders Act, 1958, Probation Officer means:
A) A person appointed to be a probation officer by the State Government or recognized as such by the State Government
B) A person provided for this purpose by a society recognized in this behalf by the State Government
C) Any person who in the opinion of the court, is fit to act as a probation officer in the special circumstances of the case
D) All of the above

22. First Women Jail was established in which of the following State in India?
A) West Bengal   B) Uttar Pradesh   C) Maharashtra   D) Madya Pradesh

23. In case of a rape of a women, who among the following is a secondary victim:
A) The women raped
B) Her husband
C) Her husband and children
D) Her husband, children or illegitimate child, if born out of such rape

24. The trait theory of leadership was advocated by:
A) Millet   B) Barnard   C) Terry   D) Ordway Tead

25. Which one of the following is not a function of staff agency?
A) Planning   B) Advising   C) Consultation   D) Achieving goals

26. Arrange Maslow's need hierarchy in descending order:

1. Social   2. Self-actualization   3. Physiological   4. Ego   5. Security
A) 3,5,1,4,2   B) 3,5,1,2,4   C) 2,4,1,3,5   D) 2,4,1,5,3

27. The total number of nominated member of Rajya Sabha are:
A) 10   B) 11   C) 12   D) 14

28. In which of the following offences, injury is not an essential ingredient?
A) Attempt   B) Abetment   C) Criminal Conspiracy   D) All of these

29. What kind of property can be involved in an offence of theft?
A) Movable property   B) Immovable property
C) Both   D) None of these

30. The trial in summons cases commences with the
A) Appearance of accused   B) Framing of Charge
C) Examination of Witness   D) None of the above

31. In which of the following case, the Supreme Court held that 'no prejudice has been caused to the rights of the accused to fair trial and non-furnishing of the copy of one of the ballistic reports had not hampered the ends of justice'?
A) Jessica Lal Case
B) Pryadarshini Mattoo Case
C) Sheena Bora Case
D) None of the above

32. The doctrine of 'autrefois acquit and autrefois convict' is incorporated in section _____ of the Code of Criminal Procedure.
A) 300
B) 301
C) 302
D) 303

33. The plea of alibi is governed by section _____ of the Indian Evidence Act.
A) Section 13
B) Section 12
C) Section 11
D) Section 10

34. The question is whether a certain document was written by A. Another document is produced which is proved or admitted to have been written by A. The opinion of experts on the question whether the two documents were written by the same person or by different person is ……….
A) Relevant
B) Irrelevant
C) Inadmissible
D) None of these

35. The Information Technology Act came into force in India with effect from:
A) January 27, 2000
B) October 17, 2000
C) August 7, 2002
D) November 2, 2005

36. The longest period for which an accused person can be ordered to be detained in police custody is _____ days.
A) 15 days
B) 30 days
C) 60 days
D) 90 days

37. The magistrate can stop investigation in a summon case, if investigation is not concluded within a period of _____ months
A) Two months
B) Three months
C) Six months
D) One year

38. A police officer has power to arrest a person accused of committing a non-cognizable offence
A) After taking permission from the superior officer
B) If he refuses to give his name and residence address
C) In the presence of a magistrate
D) Cannot be arrested in any situation

39. Which of the following is an inquiry into the apparent cause of death?
A) Inquest
B) Post-mortem
C) Autopsy
D) None of these

40. When any person is arrested and interrogated by the police, he shall be entitled to meet an advocate of his choice
A) During Interrogation
B) Throughout interrogation
C) During interrogation though not throughout interrogation
D) None of the above

41. Jurisdiction to grant an anticipatory bail is vested with the
A) High Court
B) Sessions Court
C) High Court and Sessions Court
D) None of these

42. Which ministry is the nodal ministry of government of India to respond in any disastrous situations?
A) Ministry of Home Affairs
B) Ministry of Foreign Affairs
C) Ministry of Railways
D) Ministry of Legal Affairs

43. In order to make the Confession admissible, the person _____
A) May not be an accused at the time of making confession
B) Must be an accused at the time of making the confession
C) Must be a suspect at the time of making the confession
D) None of the above

44. The footprints of the accused found near the scene of occurrence of the crime
A) Is relevant as a physical evidence
B) Is not relevant as a physical evidence
C) Is relevant only for the purpose of investigation
D) None of the above

45. Age of consent in respect of a woman other than wife is:
A) 16 year
B) 18 years
C) 12 years
D) 20 years

46. Poisoning can be
A) Homicidal
B) Suicidal
C) Accidental
D) all the above

47. Blindness caused in the consumption of adulterated liquors is due to the presence of following:
A) Methyl Alcohol
B) Ethyl Alcohol
C) Butyl Alcohol
D) all of these

48. In term of road safety, what do you understand by the term 'golden hour'?
A) That hour of the day in which minimum road accidents take place
B) That hour of the day in which maximum road accidents take place
C) The first hour after the trauma in which if proper first aid is given, the accident victim has a greater chance of survival and reduction in injuries
D) None of the above

49. Which part of the computer helps to store information?
A) Disk drive
B) Keyboard
C) Monitor
D) Printer

50. The purpose of explorative research is:
A) To gain familiarity with a phenomenon or achieve new insights into it
B) To portray accurately the characteristics of a particular individual, situation or a group
C) To determine the frequency with which something occurs
D) To test a hypothesis of a casual relationship between variables

x-x-x

Psychology(Ph.D.) (1077)

1. Who use the term "instinct" first time in Psychology?
   - A) Wilhem Wundt
   - B) Maslow
   - C) Hull
   - D) Mcdougall

2. "Mind is blank at birth and most knowledge comes from sensory experience". This statement was given by?
   - A) Freud
   - B) Aristotle
   - C) Locke
   - D) Darwin

3. When the null hypothesis is false but speciously fails to be rejected is called as?
   - A) Type-II error
   - B) Null hypothesis
   - C) Type I error
   - D) Negative hypothesis

4. The "bobo-doll" experiment was conducted by
   - A) Skinner
   - B) Freud
   - C) Bandura
   - D) Kohler

5. A hypothesis in which the direction of the results is not predicted is called;
   - A) One-tailed hypothesis
   - B) Two- tailed hypothesis
   - C) Directional hypothesis
   - D) Null hypothesis

6. The technique called exorcism is based on the assumption that mental illness is caused by:
   - A) Stigmatization
   - B) Infections
   - C) Evil spirits
   - D) Chromosomal abnormalities

7. Plato believed that disturbed behaviour grew out of conflicts between
   - A) Emotion and reason
   - B) Children and parents
   - C) Individuals and the community
   - D) Biological and psychological stressors

8. What term do we use to describe our reaction to situations that impose demands or constraints, or which offer opportunities?
   - A) Stressors
   - B) Vulnerability
   - C) Sublimation
   - D) Regression

9. Who proposed the term Electra Complex in females?
   - A) Eysenk
   - B) Jung
   - C) Freud
   - D) Allport

10. Which of the following is/are not organizational factors causing stress?
    - A) Task demand
    - B) Role demand
    - C) Role conflict
    - D) Satisfaction

11. Which of the following is an environmental force that shapes personality?
    - A) Gender
    - B) Height
    - C) Experience
    - D) Brain size

12. Which of the following is not a trait dimension in Big-5 personality trait?
    - A) Extroversion
    - B) Agreeableness
    - C) Ego
    - D) Culture

13. If everyone who is faced with a similar situation responds in the same way, attribution theory states that the behaviour shows:.
    A)   Consensus   B)   Similarity
    C)   Reliability   D)   Consistency

14. What does consensus refer to in attribution theory?
    A)   There is general agreement about a perception
    B)   Different people respond the same way in the same situation
    C)   There is general agreement about how people desire to respond to the same situation
    D)   Different people perceive a situation similarly.

15. Experiments performed by Ivan Pavlov led to what theory?
    A)   Classical conditioning   B)   Operant conditioning
    C)   Social learning   D)   Behavior shaping

16. Which of the following psychologists is best trained to treat people with schizophrenia?
    A)   Counselling   B)   Clinical
    C)   Developmental   D)   Psychometric

17. Which of the following nervous systems work in opposition to each other?
    A)   Central and peripheral   B)   Somatic and autonomic
    C)   Sympathetic and parasympathetic   D)   Central and sympathetic

18. Hormones most closely associated with stress are produced by the
    A)   Thyroid   B)   Parathyroids
    C)   Pineal   D)   Adrenals

19. Which of the following are stimulants?
    A)   Methamphetamine and codeine   B)   Caffeine and morphine
    C)   Nicotine and cocaine   D)   Alcohol and benzedrine

20. Physiological arousal, expressive behaviors and conscious experience best characterize
    A)   Emotions   B)   Motives
    C)   Incentives   D)   Drives

21. Knowing how to ride a bicycle is stored in which of our memory subsystems?
    A)   Explicit   B)   Implicit
    C)   Semantic   D)   Episodic

22. In a normal distribution
    A) The range is always the same
    B) The standard deviation is equal to the range
    C) The standard deviation equals about 34%
    D) The median is equal to the mode

23. Which of the following brain structures plays a key role in transferring information from short term memory to long-term memory?
    A)   Hypothalamus   B) Thalamus
    C)   Hippocampus   D) Frontal lobe

24. Self-efficacy, according to Bandura, is:
      A)   How you view your worth as a person
      B)   How you think about your self-image
      C)   All you know about your deficiencies and weaknesses as a person
      D)   How competent you feel to accomplish tasks and goals

25. Which of the following is NOT characteristic of the manic state of bipolar disorder?
      A)   Inflated ego   B)   Excessive talking
      C)   Too much sleep   D)   Fearlessness

26. A test which produces consistent results each time it is given to the same individual or group of people is called as?
      A)   Validity   B)   Theory
      C)   Standardisation   D)   Reliability

27. Cognitive dissonancy theory was originally formulated by
      A)   Cooper and Fazio   B)   Leon Festinger
      C)   Aronson   D)   Steele

28. Translating information in to a message in the form of symbols that represent ideas or concepts
      A)   Transmission   B)   Feedback
      C)   Encoding   D)   Decoding

29. Who has used the term 'Valence' in his theory of motivation?
      A)   Herzberg   B)   Adams
      C)   Vroom   D)   Lawler

30. To become fully functioning, Rogers believed that a person must receive
      A)   Positive modelling   B)   Congruence
      C)   Positive reinforcement   D)   Unconditional positive regard

31. Hippocrates classification of personality was based on
      A)   Humors   B)   Body-trait
      C)   Types   D)   Traits

32. The concept of creative intelligence is given by:
      A)   Guilford   B)   Torrance
      C)   Sternberg   D)   Gardner

33. According to Erikson the stage in which a child needs to learn important academic skills and compare favourably with peers in school to achieve competence is the _____ stage.
      A)   Trust vs. Mistrust   B)   Identity vs. Role Confusion
      C)   Initiative vs. Guilt   D)   Industry vs. Inferiority

34. Which of the following physical symptoms are associated with Panic attacks?
      A)   Heart palpitations   B)   Perspiring
      C)   Hyperventilating   D)   All of these

35. The psychosocial task during one's high school years is to achieve a sense of:
    A)   Industry   B)   Delinquency
    C)   Autonomy   D)   Identity

36. What is the term that Erikson coined?
    A)   Oedipus Complex   B)   Self-fulfilling Prophecy
    C)   Identity Crisis   D)   Positive Reinforcement

37. The structure of the brain responsible for the regulation of autonomic activities such as, breathing and circulation
    A)   Pons   B)   Medulla
    C)   Cerebellum   D)   Basal Ganglia

38. Hormones most closely associated with stress are produced by the
    A)   Thyroid   B)   Parathyroids
    C)   Pineal   D)   Adrenals

39. Who has suggested that heart is the mechanism of mental processes?
    A)   Plato   B)   Aristotle
    C)   Franz Mesmer   D)   Franz Gall

40. The chronological age that most typically corresponds to a given level of performance is called
    A)   Intelligence Quotient   B) Maturation
    C)   Mental age   D) None of these

41. The role of unconscious in creative thinking is known as the process of
    A)   Verification   B)   Illumination
    C)   Inoculation   D)   Incubation

42. Which is the correct order of 'Products' given by Guilford?
    A)   Units, Relations, Classes, Systems, Implications, Transformations
    B)   Units, Classes, Systems, Relations, Implications,
    C)   Units, Classes, Relations, Systems, Transformations, Implications
    D)   Units, Classes, Systems, Relations, Transformations, Implications

43. The phi-phenomenon, stroboscopic motion, induced motion and autokinetic motion are all:
    A)   Pictorial cues   B)   Apparent motion
    C)   Double images   D)   Non-verbal cues

44. Which one of the following is the most important feature of the defence mechanism of Rationalization?
    A) Going back to an earlier stage of development
    B) Justifying one's actions
    C) Magically atoning for certain acts that give rise to guilt
    D) Attributing one's emotions to other persons

(4)

45. Three A's – Achievement, Affiliation and Aggression are reflected in
    A) Emotion
    B) Motivation
    C) Ambition
    D) Expectation

46. The kind of brain cells involved in observational learning are known as
    A) Glial cells
    B) Myelin sheath
    C) Mirror Neuron
    D) Golgi body

47. Which of the following strategies is classified as "problem-focused" rather than "emotion focused"?
    A) Engaging in cognitive reappraisal
    B) Learning techniques of relaxation
    C) Seeking social support
    D) Engaging in physical exercise

48. Which of the following describes the cognitive triad of depression?
    A) Helplessness, sleeplessness, worthlessness
    B) Thoughtlessness, worthlessness, sleeplessness
    C) Hopelessness, worthlessness, thoughtlessness
    D) Hopelessness, worthlessness, helplessness

49. Which one of the following does not belong to the mechanism of operant learning?
    A) Events that follow an action
    B) Involuntary response
    C) Process that weakens or suppresses behaviour
    D) Use of consequences to strengthen behaviour

50. The Psychotherapist recommended the procedure of systematic desensitization to Ritu for overcoming her fear of cats. The Psychotherapist recommended:
    A) A classical conditioning procedure
    B) An operant conditioning procedure
    C) A delayed conditioning procedure
    D) A backward conditioning procedure

x-x-x

Public Administration(Ph.D. & M.Phil.) (1077)

1. Which of these are considered to be having "Integral view of Public Administration"?

   1. Dimock   2. White   3. Simon   4. Gulick

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

2. Whose name is associated with Mixed Scanning System ?

   A) Waldo   B) Mayo   C) Etzioni   D) Likert

3. The inaugural conference of the Commonwealth Association for Public Administration was held in the year………….
   A) 1988   B) 1983   C) 1994   D) 1998

4. Which of the following is one of the authors of " Reinventing Government"?
   A) Tead   B) Waldo   C) Buchanen   D) Gaebler

5. "Administration includes the functions of executing the law as well as the semi scientific, quasi judicial and quasi business or commercial functions ". Who said it?

   A) Gladden   B) Goodnow   C) Dernard   D) Wilson

6. "Incredulity to meta narratives" is considered as a feature of………..
   A) New Public Management   B) Neo Taylorism
   C) Marxism   D) Postmodernism

7. Which one is not an element of Rule of Fair hearing?
   A) Right to notice   B) Subject Matter bias
   C) Rule against dictation   D) Financial incapacity to attend enquiry

8. Split system in Indian administration is generally referred to……….
   A) Policy making and Executing agencies   B) Generalists and Specialists
   C) Political and Permanent executives   D) Audit and Accounts

9. Which of the followings is not a basic feature of New Public Administration?
   A) Client orientation   B) Development orientation
   C) Social equity   D) Phenomenology

10. Whose name is associated with combining Span of Control with Span of Attention ?
    A) Merton   B) Simon   C) Blau   D) Graicunus

11. Which of the following is used mainly for designing , planning and controlling a project ?
    A) MBO   B) PERT   C) MIS   D) ZBB

12. In which year the IIPA was established ?
    A) 1954   B) 1956   C) 1958   D)1959

13. Which one has not been associated with ecological approach to Public Administration?
    A) Riggs   B) Dahl   C) Goodnow   D) Gaus

14. Under the Policy Cut motion the money demanded may be reduced to :
A) Rs. 100   B) Rs. 1000   C) Rs. 0   D) Rs. 1

15. National Commission on SC is a…………….
A) Constitutional body   B) Statutory body
C) Body created by executive   D) A Society

16. Which one is not a veto power with the President of India ?
A) Suspensive veto   B) Secret veto
C) Pocket veto   D) Absolute veto

17. A " money bill " has been defined in the Constitution of India under Article…
A) 109   B) 110   C) 117   D) 118

18. Which one falls in the category of a Staff Agency?
A) Agriculture Dept.   B) NITI Aayog
C) Labour Union   D) L I C

19. Which Commission recommended 40% British and 40% Indians as direct recruits to Superior Service in India?
A) Aichison   B) Islington   C) Macaulay   D) Lee

20. Which is generally not a unit of Revenue administration ?
A) Block   B) Village   C) District   D) Tehsil

21. Which of these is not included in the eleventh Schedule of the Constitution?
A) Fisheries   B) Liberaries
C) Family Welfare   D) Rural Sports

22. An NGO may be established under….
A) Indian Companies Act   B) Cooperative Societies Act
C) Indian Trust Act   D) All of these

23. Which of these includes mainly the proposals for taxation ?
A) Appropriation Bill   B) Finance Bill
C) Supplementary Bill   D) Economy Bill

24. The setting up of Inter State Council was recommended by…
A) Punchhi Commission   B) Sarkaria Commission
C) ARC II   D) Rajamannar Commission

25. For the election of members of a Vidhan Parishad , which of these do not take part ?
A) Graduates   B) Teachers
C) Industrialists   D) Municipal Councillors

26. Mayor-in- Council system was adopted for the first time in…………..
A) Mumbai   B) Kolkatta   C) Chennai   D) Delhi

27. Ward Committees are required to be set up in the cities having a population above….
A) 3 lakh   B) 5 lakh   C) 7 lakh   D) 10 lakh

28. The Industrial Policy Resolution , 1948 divided the industries into……….categories
A) 2   B) 3   C) 4   D) 5

29. What is the percentage of urban population in India as per last census?
A) 28.9   B) 31.2   C) 33.5   D) 35.3

30. A notice of …… days is required to be served to file a suit against Government.
A) 30   B) 40   C) 50   D) 60

31. PESA Act was passed in the year…..
A) 1995   B) 1996   C) 1997   D) 1998

32. Which one is odd?
A) Statutes   B) Guidelines   C) Rules   D) Ordinances

33. Content Analysis is closely associated with…..
A) Research methodology   B) Policy Making
C) Budgeting   D) Training

34. Point Factor Rating is a technique commonly used in…..
A) Job Evaluation   B) Project Management
C) Project Management   D) Policy Analysis

35. Which one is an essential feature of NPM?
A) Focus on policy   B) Cost cutting
C) Legal remedies   D) Social equity

36. Who is considered as the pioneer of the concept of "Street level bureaucracy"?
A) R Merton   B) M. Crozier   C) P. Selznik   D) M. Lipsky

37. "In Basket Method" is Associated with …..
A) Decision Making   B) Monitoring   C) Training   D) Supervision

38. The seat of International Institute of Administrative sciences is at …………..
A) New York   B) Brussels   C) Paris   D) Berlin

39. Inductive logic proceeds from ……
A) Particular to general   B) General to general
C) Particular to particular   D) General to particular

40. Controlled group is commonly used in ……
A) Exploratory Research   B) Historical Research
C) Experimental Research   D) Descriptive Research

41. A number of motor vehicle accidents on Ludhiana road in a month is which type of variable?

A) Continuous   B) Nominal   C) Ordinal   D) Discreet numeric

42. How many Sustainable Development Goals have been set by NITI Aayog for 2030 ?

A) 17   B) 15   C) 13   D)11

43. According to Robert A. Dahl the attempt to create a science of public administration was handicapped by the three basic problems . Which are those three?

1. Values   2. Norms   3. Individual personality   4. Social Framework

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

44. Which one is generally not seen as an essential feature of civil society?

A) Non-State institute   B) Full autonomy

C) Voluntarism   D) Facilitating citizen participation

45. Which one is not a type of hypothesis?

A) Directional   B) Complex   C) Unrelated   D) Statistical

46. Who laid the foundation of Sensitivity Training?

A) Kurt Levin   B) Herbert Simon   C) Frank Marini   D) Peter Drucker

47. Match List-I with List-II and select correct answer by using the code given below the lists.

List-I	**List-II**
a) Decentralization	1. Based on political and legal action
b) Devolution	2. Based on administrative action
c) De-concentration	3. Based on functional imperative
d) Delegation	4. Based on political, legal and administrative action

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

48.

List-I (Books)	**List-II (Authors)**
a) The Dynamics of Bureaucracy	1. Warren Bennis
b) The Politics of Bureaucracy	2. Michel Crozier
c) Bureaucracy and Representative Government	3. Peter M. Blau
d) Beyond Bureaucracy	4. Gordon Tullock
	5. William Niskanen

	a	b	c	d
A)	1	2	4	5
B)	1	3	2	4
C)	3	4	5	1
D)	3	5	2	4

49. List-I

a) Incremental Approach
b) Rational Approach
c) Systems Approach
d) Normative-Optimum Model

List-II

1. Y. Dror
2. David Easton
3. H. Simon
4. H. Lasswell
5. C. Lindblom

	a	b	c	d
A)	4	5	1	2
B)	5	3	4	1
C)	4	2	1	5
D)	5	3	2	1

50. A policy that makes one or several persons better off without hurting anyone else "has the spirit of

A) Oligopoly   B) Pareto Optimality
C) Perfect Competition   D) Policy Transfer

x-x-x

Punjabi

1. ਡਾਈਗਲੌਸੀਆ (Diglossia) ਦਾ ਸੰਕਲਪ ਮੂਲ ਰੂਪ ਵਿਚ ਕਿਹੜੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨੀ ਨਾਲ ਸੰਬੰਧਿਤ ਹੈ?

   (A) ਚਾਰਲਸ ਫਰਗੂਸਨ   (B) ਨੌਅਮ ਚੋਮਸਕੀ

   (C) ਲੂਨਾਚਾਰਸਕੀ   (D) ਡੀ. ਬੋਲਿੰਗਰ

2. ਘ, ਝ, ਧ ਤੇ ਢ ਧੁਨੀਆਂ ਦਾ ਸਹੀ ਉਚਾਰਨ ਹੋਰ ਕਿਸ ਲਿੱਪੀ ਵਿਚ ਹੁੰਦਾ ਹੈ?

   (A) ਬ੍ਰਹਮੀ   (B) ਰੋਮਨ

   (C) ਦੇਵਨਾਗਰੀ   (D) ਕਿਸੇ ਵਿਚ ਵੀ ਨਹੀਂ

3. "ਮਨ ਦੇ ਭਾਵ ਪ੍ਰਗਟ ਕਰਨ ਲਈ ਜਿਨ੍ਹਾਂ ਸੰਕੇਤ ਧੁਨੀਆਂ ਦਾ ਉਚਾਰਨ ਕੀਤਾ ਜਾਂਦਾ ਹੈ, ਉਸ ਨੂੰ ਭਾਸ਼ਾ ਕਹਿੰਦੇ ਹਨ।" ਕਥਨ ਕਿਹੜੇ ਵਿਦਵਾਨ ਦਾ ਹੈ?

   (A) ਭਰਥਰੀ ਹਰੀ   (B) ਪਾਣਿਨੀ

   (C) ਦੂਨੀ ਚੰਦ   (D) ਭੋਲਾ ਨਾਥ ਤਿਵਾੜੀ

4. 'ਮੈਟਾਫਰ ਅਤੇ ਮੈਟਾਨਿਮੀ' ਦਾ ਸੰਕਲਪ ਕਿਹੜੇ ਵਿਦਵਾਨ ਨਾਲ ਸੰਬੰਧਿਤ ਹੈ?

   (A) ਸਾਸਿਊਰ   (B) ਰੋਮਨ ਜੈਕਬਸਨ

   (C) ਡੇਵਿਡ ਕ੍ਰਿਸਟਲ   (D) ਲਿਓਨਾਰਡ ਬਲੂਮਫ਼ੀਲਡ

5. "ਭਾਸ਼ਾ ਅਤੇ ਸਭਿਆਚਾਰ ਦਾ ਸੰਬੰਧ ਵਿਆਕਰਣਕ ਜੁਗਤ ਦੀ ਥਾਂ ਅਰਥ ਵਿਗਿਆਨਕ ਜੁਗਤ ਨਾਲ ਹੈ।" ਇਹ ਮੱਤ ਕਿਹੜੇ ਵਿਦਵਾਨ ਦਾ ਹੈ?

   (A) ਡਾ. ਕਾਲਾ ਸਿੰਘ ਬੇਦੀ   (B) ਡਾ. ਹਰਕੀਰਤ ਸਿੰਘ

   (C) ਡਾ. ਹਰਜੀਤ ਸਿੰਘ ਗਿੱਲ   (D) ਡਾ. ਕਰਨੈਲ ਸਿੰਘ ਥਿੰਦ

6. ਕ, ਚ, ਤ ਅਤੇ ਪ ਧੁਨੀਆਂ ਕਿਹੜੀਆਂ ਹਨ?

(A)   ਅਨਾਦੀ ਅਲਪਰਾਣ   (B)   ਅਨਾਦੀ ਮਹਾਂਪਰਾਣ

(C)   ਨਾਸਕੀ   (D)   ਨਾਦੀ

7.   'ਸ਼ਬਦਾਂ ਦੀ ਪੈੜ' ਪੁਸਤਕ ਦਾ ਲੇਖਕ ਕੌਣ ਹੈ?

(A)   ਵਣਜਾਰਾ ਬੇਦੀ   (B)   ਜੋਗਿੰਦਰ ਸਿੰਘ

(C)   ਜੀ. ਐਸ. ਰਿਆਲ   (D)   ਡਾ. ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ

8.   "ਡਾ. ਸਾਹਿਬ ਇਹ ਮੁੰਡਾ ਨਾ ਸਲੀਪਦਾ ਹੈ, ਨਾ ਈਟਦਾ ਹੈ, ਬਸ ਵੀਪਦਾ ਹੀ ਵੀਪਦਾ ਹੈ।" ਅਜਿਹੀ ਭਾਸ਼ਾ ਨੂੰ ਕਿਹੜੀ ਭਾਸ਼ਾ ਕਿਹਾ ਜਾਂਦਾ ਹੈ?

(A)   ਪਿਜ਼ਿਨ   (B)   ਅੰਗਰੇਜ਼ੀ   (C)   ਅਪਭਾਸ਼ਾ   (D)   ਮਿਸ਼ਰਤ

9.   ਅਚਾਰੀਆ ਆਨੰਦ ਵਰਧਨ ਨੇ 'ਧੁਨੀ ਸਿਧਾਂਤ' ਨੂੰ ਕਿਹੜੀ ਸਦੀ ਵਿਚ ਸਥਾਪਤ ਕੀਤਾ?

(A)   ਪੰਜਵੀਂ   (B)   ਸੱਤਵੀਂ

(C)   ਨੌਵੀਂ   (D)   ਚੌਥੀ

10●   'ਔਚਿਤਯ ਸਿਧਾਂਤ' ਦਾ ਸਥਾਪਨਾਕਾਰ ਕੌਣ ਹੈ?

(A)   ਧਨੰਜਯ   (B)   ਮੰਮਟ

(C)   ਅਭਿਨਵ ਗੁਪਤ   (D)   ਕਸ਼ੇਮੇਂਦੂ

11.   ਹੇਠ ਲਿਖੇ ਵਰਗਾਂ ਵਿਚੋਂ ਭਾਸ਼ਾ ਵਿਗਿਆਨੀਆਂ ਦਾ ਸਹੀ ਵਰਗ ਕਿਹੜਾ ਹੈ?

(A)   ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ, ਡਾ. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਡਾ. ਪਰੇਮ ਸਿੰਘ

(B)   ਡਾ. ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ, ਡਾ. ਹਰਕੀਰਤ ਸਿੰਘ, ਡਾ. ਮਨਜੀਤ ਸਿੰਘ

(C)   ਦੁਨੀ ਚੰਦ, ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਡਾ. ਭੁਪਿੰਦਰ ਸਿੰਘ ਖਹਿਰਾ

(D)   ਡਾ. ਹਰਕੀਰਤ ਸਿੰਘ, ਡਾ. ਵੇਦ ਅਗਨੀਹੋਤਰੀ, ਡਾ. ਮਹਿੰਦਰ ਕੌਰ ਗਿੱਲ

12. 'ਰਾਜਸੀ ਅਵਚੇਤਨ' ਦਾ ਸੰਕਲਪ ਕਿਹੜੇ ਵਿਦਵਾਨ ਨਾਲ ਸੰਬੰਧਿਤ ਹੈ?

(A) ਜੂਲੀਆ ਕ੍ਰਿਸਤੀਵਾ   (B) ਰੇਅਮੰਡ ਵਿਲੀਅਮਜ਼

(C) ਕ੍ਰਿਸਟੋਫ਼ਰ ਕਾਡਵੈਲ   (D) ਫਰੈਡਰਿਕ ਜੇਮਸਨ

13. 'ਆਧਾਰ ਅਤੇ ਪਰਾ-ਸੰਰਚਨਾ' ਦਾ ਸੰਕਲਪ ਕਿਹੜੀ ਆਲੋਚਨਾ ਪ੍ਰਣਾਲੀ ਨਾਲ ਸੰਬੰਧਿਤ ਹੈ?

(A) ਮਾਰਕਸਵਾਦੀ   (B) ਸੰਰਚਨਾਵਾਦੀ

(C) ਉੱਤਰ ਸੰਰਚਨਾਵਾਦੀ   (D) ਮਨੋਵਿਸ਼ਲੇਸ਼ਨਾਤਮਕ

14. ਪੰਜਾਬੀ ਮੈਟਾ-ਆਲੋਚਨਾ ਨਾਲ ਸੰਬੰਧਿਤ ਵਿਦਵਾਨਾਂ ਦਾ ਕਿਹੜਾ ਜੁੱਟ ਸਹੀ ਹੈ?

(A) ਹਰਿਭਜਨ ਸਿੰਘ ਭਾਟੀਆ ਅਤੇ ਗੁਰਬਖ਼ਸ਼ ਸਿੰਘ ਫ਼ਰੈਂਕ

(B) ਜਗਬੀਰ ਸਿੰਘ ਅਤੇ ਸੁਰਿੰਦਰ ਸਿੰਘ ਦੁਸਾਂਝ

(C) ਟੀ. ਆਰ. ਵਿਨੋਦ ਅਤੇ ਗੁਰਚਰਨ ਸਿੰਘ ਅਰਸ਼ੀ

(D) ਸੁਰਜੀਤ ਸਿੰਘ ਭੱਟੀ ਅਤੇ ਹਰਿਭਜਨ ਸਿੰਘ ਭਾਟੀਆ

15. "ਨਿੱਕੀ ਕਹਾਣੀ ਸਧਾਰਨ ਮਨੁੱਖ ਦੀ ਸਧਾਰਨਤਾ ਨੂੰ ਪੇਸ਼ ਕਰਦੀ ਹੈ।" ਇਹ ਵਿਚਾਰ ਪਹਿਲੀ ਵਾਰ ਕਿਹੜੇ ਵਿਦਵਾਨ ਨੇ ਪੇਸ਼ ਕੀਤਾ?

(A) ਪ੍ਰੋ. ਕਿਸ਼ਨ ਸਿੰਘ   (B) ਜੋਗਿੰਦਰ ਸਿੰਘ ਰਾਹੀ

(C) ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ   (D) ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ

16. 'ਸਮਦਰਸ਼ਨ' ਪੁਸਤਕ ਦਾ ਲੇਖਕ ਕੌਣ ਹੈ?

(A) ਡਾ. ਅਤਰ ਸਿੰਘ   (B) ਡਾ. ਰਤਨ ਸਿੰਘ ਜੱਗੀ

(C) ਡਾ. ਸੁਤਿੰਦਰ ਸਿੰਘ ਨੂਰ   (D) ਡਾ. ਬਿਕਰਮ ਸਿੰਘ ਘੁੰਮਣ

17. "ਹਿੰਦੂ ਅੰਨਾ ਤੁਰਕੂ ਕਾਣਾ।

ਦੁਹਾਂ ਤੇ ਗਿਆਨੀ ਸਿਆਣਾ।"

ਉਪਰੋਕਤ ਸਤਰਾਂ ਕਿਸ ਬਾਣੀਕਾਰ ਦੀਆਂ ਹਨ?

(A) ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ

(B) ਗੁਰੂ ਅਰਜਨ ਦੇਵ ਜੀ

(C) ਨਾਮਦੇਵ

(D) ਕਬੀਰ

18. 'ਸਾਧੂ ਆਨੰਦਘਨ' ਗੁਰਬਾਣੀ ਦੀ ਕਿਹੜੀ ਵਿਆਖਿਆ ਪ੍ਰਣਾਲੀ ਨਾਲ ਸੰਬੰਧਿਤ ਵਿਆਖਿਆਕਾਰ ਹਨ?

(A) ਨਿਰਮਲਾ ਪ੍ਰਣਾਲੀ

(B) ਉਦਾਸੀ ਪ੍ਰਣਾਲੀ

(C) ਸਹਜ ਪ੍ਰਣਾਲੀ

(D) ਪਰਮਾਰਥ ਪ੍ਰਣਾਲੀ

19. 'ਗੁਰਮਤ ਮਾਰਤੰਡ' ਪੁਸਤਕ ਦਾ ਲੇਖਕ ਕੌਣ ਹੈ?

(A) ਡਾ. ਗੁਰਦੇਵ ਸਿੰਘ

(B) ਡਾ. ਤਾਰਨ ਸਿੰਘ

(C) ਭਾਈ ਜੋਧ ਸਿੰਘ

(D) ਭਾਈ ਕਾਨੂ ਸਿੰਘ ਨਾਭਾ

20. ਸ੍ਰੀ ਗੁਰੂ ਗ੍ਰੰਥ ਸਾਹਿਬ ਵਿਚ ਆਏ 'ਵਾਰ, ਛੰਤ, ਬਾਰਹਮਾਹ' ਕਾਵਿ ਰੂਪ ਕਿਹੜੀ ਪਰੰਪਰਾ ਨਾਲ ਸੰਬੰਧਿਤ ਹਨ?

(A) ਲੋਕਧਾਰਾਈ

(B) ਸੰਸਕ੍ਰਿਤ

(C) ਇਸਲਾਮਕ

(D) ਸਿੱਧ-ਨਾਥ

21. ਡਾ. ਤ੍ਰਿਲੋਚਨ ਸਿੰਘ ਬੇਦੀ ਕਿਹੜੀ ਪੁਸਤਕ ਨੂੰ ਪੁਰਾਤਨ ਪੰਜਾਬੀ ਵਾਰਤਕ ਦਾ ਪਹਿਲਾ ਨਮੂਨਾ ਮੰਨਦਾ ਹੈ?

(A) ਕੱਤਕ ਕਿ ਵਿਸਾਖ

(B) ਜਨਮਸਾਖੀ ਭਾਈ ਬਾਲਾ

(C) ਏਕਾਦਸੀ ਮਹਾਤਮ

(D) ਸੌ ਸਾਖੀ

22. ਨਿਮਨਲਿਖਤ ਜੁੱਟਾਂ ਵਿੱਚੋਂ ਪੁਰਾਤਨ ਪੰਜਾਬੀ ਵਾਰਤਕ ਦੇ ਰੂਪਾਕਾਰਾਂ ਨਾਲ ਸੰਬੰਧਿਤ ਸਹੀ ਜੁੱਟ ਕਿਹੜਾ ਹੈ?

   (A) ਸਾਖੀਆਂ, ਪਰਚੀਆਂ, ਬਚਨ   (B) ਜਨਮਸਾਖੀ, ਗੋਸ਼ਟ, ਅਲਾਹੁਣੀ

   (C) ਗੋਸ਼ਟ, ਪਰਚੀਆਂ, ਡਿਉਢ   (D) ਟੀਕਾ, ਰਹਿਤਨਾਮਾ, ਗੰਢਾਂ

23. ਨਿਮਨਲਿਖਤ ਵਰਗਾਂ ਵਿੱਚੋਂ ਵਾਰ ਦੀ ਗਾਉਣ ਧੁਨੀ ਦਾ ਕਿਹੜਾ ਵਰਗ ਗਲਤ ਹੈ?

   (A) ਕਾਨੜੇ ਕੀ ਵਾਰ ਮਹਲਾ ਪਹਿਲਾ: ਮੂਸੇ ਕੀ ਵਾਰ ਕੀ ਧੁਨੀ

   (B) ਵਡਹੰਸ ਕੀ ਵਾਰ ਮਹਲਾ ਚੌਥਾ:   ਲਲਾ ਬਹਿਲੀਮਾ ਕੀ ਧੁਨੀ

   (C) ਮਲਾਰ ਕੀ ਵਾਰ ਮਹਲਾ ਪਹਿਲਾ: ਰਾਣੇ ਕੈਲਾਸ਼ ਤਥਾ ਮਾਲਦੇਵ ਕੀ ਧੁਨੀ

   (D) ਰਾਮਕਲੀ ਕੀ ਵਾਰ ਮਹਲਾ ਤੀਜਾ: ਰਾਇ ਕਮਾਲ ਕੀ ਮਜਦੀ ਕੀ ਧੁਨੀ

24. 'ਵਾਰ ਹਕੀਕਤ ਰਾਇ' ਦਾ ਰਚਨਹਾਰ ਕੌਣ ਹੈ?

   (A) ਦੇਵੀ ਦਾਸ   (B) ਕੇਸ਼ਵ ਦਾਸ

   (C) ਅਗਰੇ   (D) ਪੀਰ ਮੁਹੰਮਦ

25. "ਵਹਿ ਪ੍ਰਗਟਿਓ ਮਰਦ ਅਗੰਮੜਾ ਵਰਿਆਮ ਇਕੇਲਾ।

   ਵਾਹ ਵਾਹ ਗੋਬਿੰਦ ਸਿੰਘ ਆਪੇ ਗੁਰ ਚੇਲਾ।"

   ਇਹ ਸਤਰਾਂ ਕਿਹੜੇ ਵਾਰਕਾਰ ਦੀਆਂ ਹਨ?

   (A) ਭਾਈ ਗੁਰਦਾਸ   (B) ਕਵੀ ਗੁਰਦਾਸ

   (C) ਸੋਹਣ ਸਿੰਘ ਸੀਤਲ   (D) ਕਵੀ ਸੋਭਾ

26. ਪੀਲੂ ਦਾ ਕਿੱਸਾ ਮਿਰਜਾ ਸਾਹਿਬਾਂ ਕਿਹੜੇ ਕਾਵਿ ਰੂਪ ਵਿੱਚ ਹੈ?

   (A) ਸੱਦ   (B) ਸੀਹਰਫ਼ੀ

   (C) ਪੱਟੀ   (D) ਜੰਗਨਾਮਾ

27. ‘ਸੈਫ਼ਲ ਮਲੂਕ’ ਕਿੱਸੇ ਦਾ ਰਚਨਹਾਰ ਕੌਣ ਹੈ?

   (A)   ਅਹਿਮਦ ਗੁੱਜਰ   (B)   ਗ਼ੁਲਾਮ ਰਸੂਲ

   (C)   ਮੁਕਬਲ   (D)   ਮੁਹੰਮਦ ਬਖ਼ਸ਼

28. ਦਮੋਦਰ ਦੇ ਕਿੱਸੇ ਹੀਰ ਵਿਚ ਕਿਹੜੀ ਉਪਭਾਸ਼ਾ ਦਾ ਵਧੇਰੇ ਪ੍ਰਭਾਵ ਦੇਖਣ ਨੂੰ ਮਿਲਦਾ ਹੈ?

   (A)   ਲਹਿੰਦੀ   (B)   ਮੁਲਤਾਨੀ

   (C)   ਸਰਾਇਕੀ   (D)   ਮਾਝੀ

29. ਹਜ਼ਰਤ ਸ਼ੁਲਤਾਨ ਬਾਹੁ ਕਿਹੜੇ ਸੂਫ਼ੀ ਸਿਲਸਲੇ ਨਾਲ ਸੰਬੰਧਿਤ ਸੀ?

   (A)   ਚਿਸ਼ਤੀ   (B)   .ਕਾਦਰੀ

   (C)   ਸ਼ਹਰਾਵਰਦੀ   (D)   ਨਕਸ਼ਬੰਦੀ

30. ‘ਇਸਲਾਮ ਅਤੇ ਸੂਫ਼ੀਵਾਦ’ ਪੁਸਤਕ ਦਾ ਲੇਖਕ ਕੌਣ ਹੈ?

   (A)   ਡਾ. ਦੀਵਾਨ ਸਿੰਘ   (B)   ਡਾ. ਮੋਹਨ ਸਿੰਘ ਦੀਵਾਨਾ

   (C)   ਪ੍ਰੋ. ਗੁਲਵੰਤ ਸਿੰਘ   (D)   ਡਾ. ਹਰਨਾਮ ਸਿੰਘ ਸ਼ਾਨ

31. ਨਿਮਨਲਿਖਤ ਜੁੱਟਾਂ ਵਿੱਚੋਂ ਕਿਹੜਾ ਜੁੱਟ ਲੋਕਧਾਰਾ ਦੇ ਮੁੱਖ ਤੱਤਾਂ ਨੂੰ ਵਿਗਿਆਨਕ ਰੂਪ ਵਿਚ ਪੇਸ਼ ਕਰਦਾ ਹੈ?

   (A)   ਪਰੰਪਰਾ, ਅਨੁਸ਼ਠਾਨ, ਮੇਲੇ ਅਤੇ ਵਾਤਾਵਰਣ

   (B)   ਲੋਕ ਮਨ, ਅੰਧ ਵਿਸ਼ਵਾਸ਼, ਆਵਾਜਾਈ ਅਤੇ ਟੈਬੂ

   (C)   ਲੋਕ ਪ੍ਰਵਾਨਗੀ, ਲੋਕ ਗੀਤ, ਟੈਬੂ ਅਤੇ ਬਿਰਾਦਰੀ

   (D)   ਪਰੰਪਰਾ, ਲੋਕ ਮਨ, ਲੋਕ ਸੰਸਕ੍ਰਿਤੀ ਅਤੇ ਲੋਕ ਪ੍ਰਵਾਨਗੀ

32. ‘ਸੰਮੀ’ ਲੋਕ ਨਾਚ ਦਾ ਪੰਜਾਬ ਦੀ ਕਿਹੜੀ ਧਰਤੀ ਦੇ ਲੋਕਾਂ ਨਾਲ ਸੰਬੰਧ ਹੈ?

(A)	ਨੀਲੀਬਾਰ	(B)	ਸਾਂਦਲਬਾਰ
(C)	ਪਹਾੜੀ	(D)	ਮਾਝਾ

33. ਸਈਅਦ ਭੁੱਟਾ ਦੀ ਪੁਸਤਕ 'ਨੈਣ ਨਾ ਰਹਿੰਦੇ ਤੱਕਣੋਂ' ਪੰਜਾਬ ਦੇ ਕਿਹੜੇ ਇਲਾਕੇ ਦੇ ਗੀਤਾਂ ਨਾਲ ਸੰਬੰਧਿਤ ਹੈ?

(A)	ਬੀਤ ਦੇ ਗਾਉਣ	(B)	ਸਿੰਧੀ ਗਾਉਣ
(C)	ਝੰਗ ਦੇ ਗਾਉਣ	(D)	ਕੰਢੀ ਦੇ ਗਾਉਣ

34. ਸਿਧਾਂਤਕ ਤੌਰ 'ਤੇ 'ਸਭਿਆਚਾਰ' ਨੂੰ ਕਿਹੜਾ ਵਰਤਾਰਾ ਮੰਨਿਆ ਜਾਂਦਾ ਹੈ?

(A)	ਪ੍ਰਤੀਕਾਤਮਕ	(B)	ਪ੍ਰਕਿਰਤਕ
(C)	ਮਾਨਵ ਨਿਰਲੇਪ	(D)	ਧਾਰਮਿਕ

35. 'ਕਰੇਵਾ' ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਵਿਚ ਜੀਵਨ ਦੇ ਕਿਹੜੇ ਖੇਤਰ ਨਾਲ ਸੰਬੰਧਿਤ ਪ੍ਰਕਿਰਿਆ ਹੈ?

(A)	ਨਿਆਂ	(B)	ਲੋਕ ਧਰਮ
(C)	ਲੋਕ ਵਿਸ਼ਵਾਸ਼	(D)	ਵਿਆਹ

36. 'ਬੁੱਲ੍ਹਾ' ਨਾਟਕ ਦਾ ਲੇਖਕ ਕੌਣ ਹੈ?

(A)	ਇਸਹਾਕ ਮੁਹੰਮਦ	(B)	ਨਜ਼ਮ ਹੁਸੈਨ ਸੱਯਦ
(C)	ਸ਼ਾਹਿਦ ਨਦੀਮ	(D)	ਇਲਆਸ ਘੁੰਮਣ

37. ਪੰਜਾਬੀ ਰੰਗਮੰਚ ਪਰੰਪਰਾ ਵਿਚ 'ਨੁੱਕੜ ਨਾਟਕ ਸ਼ੈਲੀ' ਦਾ ਪ੍ਰਮੁੱਖ ਨਾਟਕਕਾਰ ਕੌਣ ਹੈ?

(A)	ਅਜਮੇਰ ਸਿੰਘ ਔਲਖ	(B)	ਕੇਵਲ ਧਾਲੀਵਾਲ
(C)	ਦੇਵਿੰਦਰ ਦਮਨ	(D)	ਗੁਰਸ਼ਰਨ ਸਿੰਘ

38. ਨਿਮਨਲਿਖਤ ਜੁੱਟਾਂ ਵਿੱਚੋਂ ਕਿਹੜਾ ਜੁੱਟ ਸਹੀ ਹੈ?

(A) ਪ੍ਰਯੋਗਸ਼ੀਲ ਕਵੀ:   ਅਜਾਇਬ ਕਮਲ, ਬਾਵਾ ਬਲਵੰਤ

(B) ਦਲਿਤ ਕਵੀ:   ਚੰਨਣ ਸਿੰਘ ਜੇਠੁਵਾਲੀਆ, ਗੁਰਦਾਸ ਰਾਮ ਆਲਮ

(C) ਜੁਝਾਰਵਾਦੀ ਕਵੀ:   ਲਾਲ ਸਿੰਘ ਦਿਲ, ਹਰਿਨਾਮ

(D) ਪਰਵਾਸੀ ਕਵੀ:   ਨਿਰੰਜਨ ਸਿੰਘ ਨੂਰ, ਅਵਤਾਰ ਜੰਡਿਆਲਵੀ

39. ਨਕਸਲੀ ਲਹਿਰ ਦੇ ਪ੍ਰਭਾਵ ਅਧੀਨ ਰਚੀ ਗਈ ਕਵਿਤਾ ਨੂੰ ਪੰਜਾਬੀ ਦੇ ਕਿਹੜੇ ਆਲੋਚਕ ਨੇ 'ਇਤਿਹਾਸਕ ਚੇਤਨਾਮੁਖੀ ਕਾਵਿ' ਕਿਹਾ ਹੈ?

(A) ਡਾ. ਰਵਿੰਦਰ ਸਿੰਘ ਰਵੀ   (B) ਡਾ. ਕਰਮਜੀਤ ਸਿੰਘ

(C) ਡਾ. ਕੇਸਰ ਸਿੰਘ ਕੇਸਰ   (D) ਹਰਭਜਸ਼ ਮਕਸੂਦਪੁਰੀ

40. ਬਲਬੀਰ ਮਾਧੋਪੁਰੀ ਦੀ ਪੁਸਤਕ 'ਛਾਂਗਿਆ ਰੁੱਖ' ਸਾਹਿਤ ਦੀ ਕਿਹੜੀ ਵਿਧਾ ਨਾਲ ਸੰਬੰਧਿਤ ਹੈ?

(A) ਨਾਵਲ   (B) ਕਹਾਣੀ

(C) ਸਵੈਜੀਵਨੀ   (D) ਨਿਬੰਧ

41. ਨਿਮਨਲਿਖਤ ਲੇਖਕਾਂ ਅਤੇ ਉਨ੍ਹਾਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਦਾ ਕਿਹੜਾ ਜੁੱਟ ਸਹੀ ਨਹੀਂ ਹੈ?

(A) ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼:   ਕੱਚਕੜੇ, ਮੁਕਤੀ

(B) ਸਵਰਾਜਬੀਰ: ਕੱਲਰ, ਅਗਨੀ ਕੁੰਡ

(C) ਹਰਿਭਜਨ ਸਿੰਘ: ਦਿਨ ਦੀਵੀਂ ਲੁੱਟ, ਚੋਲਾ ਟਾਕੀਆਂ ਵਾਲਾ

(D) ਗੁਰਬਚਨ ਸਿੰਘ ਭੁੱਲਰ: ਅਗਨੀ ਕਲਸ, ਦੀਵੇ ਵਾਂਗ ਬਲਦੀ ਅੱਖ

42. 'ਬੰਦਿਆ ਤੇਰੀਆਂ ਦਸ ਦੇਹੀਆਂ,

ਇਕੋ ਗਈ ਵਿਹਾ ਨੌ ਕਿਧਰ ਗਈਆਂ।"

ਪੰਜਾਬੀ ਦੇ ਕਿਹੜੇ ਨਾਵਲ ਵਿਚ ਇਹ ਧਾਰਨਾ ਗਹਿਰੇ ਰੂਪ ਵਿਚ ਸਮਾਈ ਹੋਈ ਹੈ?

(A) ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ ਦੇ 'ਲਹੂ ਮਿੱਟੀ' ਨਾਵਲ ਵਿਚ

(B) ਰਾਮ ਸਰੂਪ ਅਣਖੀ ਦੇ 'ਦੁੱਲੇ ਦੀ ਢਾਬ' ਨਾਵਲ ਵਿਚ

(C) ਗੁਰਚਰਨ ਸਿੰਘ ਰਾਓ ਦੇ 'ਮਸ਼ਾਲਚੀ' ਨਾਵਲ ਵਿਚ

(D) ਗੁਰਦਿਆਲ ਸਿੰਘ ਦੇ 'ਮੜ੍ਹੀ ਦਾ ਦੀਵਾ' ਨਾਵਲ ਵਿਚ

43. ਕਿਹੜੇ ਲੇਖਕ ਨੇ ਸਵੈਜੀਵਨੀ ਕਵਿਤਾ ਰੂਪ ਵਿਚ ਲਿਖੀ ਹੈ?

(A) ਦੇਵ   (B) ਸ਼ਿਵ ਕੁਮਾਰ

(C) ਨਵਤੇਜ ਭਾਰਤੀ   (D) ਸ.ਸ. ਮੀਸ਼ਾ

44. "ਦਿਲਚਸਪ ਗੱਲ ਇਹ ਹੈ ਕਿ ਪੰਜਾਬੀ ਨਾਵਲ ਦੇ ਆਲੋਚਕਾਂ ਦੀ ਬਹੁਗਿਣਤੀ ਨੇ ਕੰਵਲ ਨੂੰ ਪ੍ਰਗਤੀਵਾਦੀ ਨਾਵਲਕਾਰ ਹੋਣ ਦੇ ਨਾਤੇ ਯਥਾਰਥਵਾਦੀ ਨਾਵਲਕਾਰ ਸਵਿਕਾਰ ਨਹੀਂ ਕੀਤਾ।"

ਇਹ ਕਥਨ ਕਿਹੜੇ ਆਲੋਚਕ ਦਾ ਹੈ?

(A) ਡਾ. ਜਸਬੀਰ ਸਿੰਘ ਆਹਲੂਵਾਲੀਆ   (B) ਡਾ. ਜੋਗਿੰਦਰ ਸਿੰਘ ਰਾਹੀ

(C) ਡਾ. ਜਰਿੰਦਰ ਸਿੰਘ ਨਹਿਰੂ   (D) ਡਾ. ਟੀ. ਆਰ. ਵਿਨੋਦ

45. ਨਿਮਨਲਿਖਤ ਲਹਿਰਾਂ ਦੀ ਤਰਤੀਬ ਦਾ ਕਿਹੜਾ ਵਰਗ ਸਹੀ ਹੈ?

(A) ਸਿੰਘ ਸਭਾ ਲਹਿਰ, ਗਦਰ ਲਹਿਰ, ਪਗੜੀ ਸੰਭਾਲ ਜੱਟਾ, ਬੱਬਰ ਅਕਾਲੀ ਲਹਿਰ

(B) ਬੱਬਰ ਅਕਾਲੀ ਲਹਿਰ, ਸਿੰਘ ਸਭਾ ਲਹਿਰ, ਪਗੜੀ ਸੰਭਾਲ ਜੱਟਾ, ਗਦਰ ਲਹਿਰ

(C) ਸਿੰਘ ਸਭਾ ਲਹਿਰ, ਪਗੜੀ ਸੰਭਾਲ ਜੱਟਾ, ਗਦਰ ਲਹਿਰ, ਬੱਬਰ ਅਕਾਲੀ ਲਹਿਰ

(D) ਸਿੰਘ ਸਭਾ ਲਹਿਰ, ਬੱਬਰ ਅਕਾਲੀ ਲਹਿਰ, ਗਦਰ ਲਹਿਰ, ਪਗੜੀ ਸੰਭਾਲ ਜੱਟਾ

46. ਨਿਮਨਲਿਖਤ ਸਫ਼ਰਨਾਮਾ ਵਰਗ ਵਿਚ ਕਿਹੜਾ ਜੁੱਟ ਗਲਤ ਹੈ?

(A) ਸੋਹਨ ਸਿੰਘ ਜੋਸ਼   :   ਮੇਰੀ ਰੂਸ ਯਾਤਰਾ

(B) ਡਾ. ਗੰਡਾ ਸਿੰਘ   :   ਅਫ਼ਗਾਨਿਸਤਾਨ ਦਾ ਸਫ਼ਰ

(C) ਲਾਲ ਸਿੰਘ ਕਮਲਾ ਅਕਾਲੀ   :   ਮੇਰਾ ਵਲਾਇਤੀ ਸਫ਼ਰਨਾਮਾ

(D)　ਨਰਿੰਦਰਪਾਲ ਸਿੰਘ　　　　　:　　　　ਦੋਸਤੀ ਦੇ ਪੰਧ

47.　ਡਾ. ਕਰਨਜੀਤ ਸਿੰਘ ਦੀ ਪੁਸਤਕ 'ਕਲਮ ਦੀ ਅੱਖ' ਕਿਹੜੀ ਵਿਧਾ ਨਾਲ ਸੰਬੰਧਿਤ ਹੈ?

(A)　ਰੇਖਾ ਚਿਤਰ　　　　　　(B)　ਸੰਸਮਰਨ

(C)　ਡਾਇਰੀ　　　　　　　(D)　ਜੀਵਨੀ

48.　ਪੰਜਾਬੀ ਦੀ ਪਹਿਲੀ ਵਿਆਕਰਨ 'ਗਰਾਮਰ ਆਫ ਦਾ ਪੰਜਾਬੀ ਲੈਂਗੂਏਜ' ਦਾ ਲੇਖਕ ਕੌਣ ਹੈ?

(A)　ਜੇਮਜ਼ ਐਮ. ਈਵਨ　　　　(B)　ਵਿਲੀਅਮ ਕੇਰੀ

(C)　ਜਾਹਨ ਨਿਉਟਨ　　　　　(D)　ਐਮ. ਵਾਇਲੀ

49.　ਆਰ. ਸੀ. ਟੈਂਪਲ ਤੋਂ ਬਿਨਾਂ ਹੋਰ ਕਿਹੜਾ ਅੰਗਰੇਜ਼ ਵਿਦਵਾਨ ਹੈ ਜਿਸਨੇ ਪੰਜਾਬੀ ਲੋਕਧਾਰਾ ਸੰਗ੍ਰਹਿ ਵਿਚ ਯੋਗਦਾਨ ਦਿੱਤਾ?

(A)　ਜੀ. ਵਿਲਸਨ　　　　　(B)　ਕੈਪਟਨ ਵੇਡ

(C)　ਚਾਰਲਸ ਸਵਿਨਰਟਨ　　　(D)　ਗਰੀਅਰਸਨ

5●.　ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਚ ਪ੍ਰਸਿੱਧ ਅਨੁਵਾਦਿਤ ਪੁਸਤਕ 'ਚਿੱਠੀਆਂ ਬਿਨ ਸਿਰਨਾਵਿਓਂ' ਦਾ ਮੂਲ ਲੇਖਕ ਕੌਣ ਹੈ?

(A)　ਮੈਕਸਿਮ ਗੋਰਕੀ　　　　(B)　ਲਿਓ ਟਾਲਸਟਾਏ

(C)　ਜੈਕ ਲੰਡਨ　　　　　(D)　ਜੀ. ਪਲੈਖਾਨੋਵ

x-x-x

Sanskrit(1077)

1. 'गोपामृतस्य दीदिविम्' इति मंत्रांशः श्रूयते--
   (A) पृथिवीसूक्ते   (B) अग्निसूक्ते   (C) विष्णुसूक्ते   (D) वाक्सूक्ते

2. ब्राह्मणप्रतिपाद्यविधयः कियन्तः?
   (A) द्वादश   (B) पञ्चदश   (C) दश   (D) अष्ट

3. पौर्णमासेष्टौ कति प्रयाजाः भवन्ति ?
   (A) सप्त   (B) दश   (C)अष्ट   (D) पञ्च

4. शुनःशेपाख्याने प्राधान्येन स्तुतः देवः कः ?
   (A) कुबेरः   (B) इन्द्रः   (C) विष्णुः   (D) वरुणः

5. एषु प्राचीनो वेदभाष्यकारो न वर्तते—
   (A) उव्वटः   (B)महीधरः   (C) अरविन्दः   (D) सायणः

6. 'विद्यया विन्दतेऽमृतम्' इति कुत्रोपदिष्टम्?
   (A) ईशावास्योपनिषदि   (B) केनोपनिषदि
   (C) तैत्तिरीयोपनिषदि   (D) कठोपनिषदि

7. 'युवा स्यात् साधुयुवा' इति कुत्रोपदिश्यते?
   (A) तैत्तिरीयोपनिषदि   (B) बृहदारण्यकोपनिषदि
   (C) कठोपनिषदि   (D) केनोपनिषदि

8. राष्ट्राभिवर्धनसूक्तं कस्यां शाखायां विद्यते?
   (A) शाकलशाखायां   (B) काण्वशाखायां   (C) जैमिनीयशाखायां   (D)

शौनकशाखायां

9. अग्निष्टोमयागो वर्तते—
   (A) पाकयज्ञः   (B)हविर्यज्ञः   (C) सोमयज्ञः   (D) स्मार्तयज्ञः

10. समुद्रव्रन्त्यस्मादाप इत्यनेन को निर्दिश्यते?
    (A) मेघः   (B) ह्रदः   (C) समुद्रः   (D) नदी

11. अधोऽङ्कितानां युग्मानां समीचीनां तालिकां चिनुत—

(A)	(B)
(a) प्राचां ष्फ	1. क्रियातिपत्तौ
(b) लिङ्निमित्ते लृङ्	2. तृतीयान्यन्तरस्याम्
(c) प्रेष्यब्रुवोर्हविष्यो	3. तद्धितः
(d) तुल्यार्थैरतुलोपमाभ्यां	4. देवतासम्प्रदाने

          (a)   (b)   (c)   (d)

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

12. "आख्यातोपयोगे" इति सूत्रस्योदाहरणं किम्?

(A) मातुर्निलीयते कृष्णः (B)नटस्य गाथां शृणोति

(C) उपाध्यायादधीते (D)हिमवतो गङ्गा प्रभवति

13. 'केशकः' इत्यत्र कन् प्रत्ययः केन सूत्रेण विधीयते?

(A) विमुक्तादिभ्योऽण् (B) स्वाङ्गेभ्यः प्रसिते (C) कुल्माषादञ् (D) पूर्वादिनिः

14. भारोपीयपरिवारे भारत-ईरानीवर्गः कस्मिन् वर्गे?

(A) केन्टुमवर्गः (B)शतंवर्गः (C) चीनीपरिवारः (D)

आर्मीनीपरिवारः

15. 'शोणो धावति' इत्यत्र का लक्षणा?

(A) भागलक्षणा (B) जहल्लक्षणा (C) अजहल्लक्षणा (D)

जहदजहल्लक्षणा

16. वेदान्तानुसारं कतिविधः समाधिः?

(A) द्विविधः (B) त्रिविधः (C) चतुर्विधः (D) पञ्चविधः

17. 'वेदान्त' शब्दस्य पर्यायः कः?

(A) न्यायदर्शनम् (B) पूर्वमीमांसा (C) उत्तरमीमांसा (D)

सांख्यदर्शनम्

18. सांख्यदर्शने कति प्रमाणानि स्वीकृतानि?

(A)एकः (B)द्वौ (C) त्रीणि (D) चत्वारि

19. सांख्यदर्शने सूक्ष्मशरीरं कति तत्त्वात्मकम्?

(A) एकादश (B) द्वादश (C)अष्टादश (D) पञ्चविंशतिः

20. लोकेऽतिप्रसिद्धा 'श्रीमद्भगवद्गीता' महाभारतस्यकस्मिन् पर्वण्युपनिबद्धा?

(A) अरण्यपर्वणि (B) भीष्मपर्वणि (C) शान्तिपर्वणि (D) विराट्पर्वणि

21. कस्मिन्पुराणे काव्यशास्त्रसम्बन्धिविषयाः सर्वे उट्टङ्किताः वर्तन्ते?

(A)ब्रह्मपुराणे (B)ब्रह्माण्डपुराणे (C) नारदपुराणे (D) अग्निपुराणे

22. 'प्रतिबध्नाति हि श्रेयः पूज्यपूजाव्यतिक्रमः'–कस्येयमुक्तिः?

(A) कामधेनोः (B)नन्दिन्याः (C) दिलीपस्य (D) वसिष्ठस्य

23. 'नमुचिद्विषा'–इत्यस्य पदस्य कोऽर्थः?

(A) नारदेन   (B) इन्द्रेण   (C) रावणेन   (D) माघेन

24. 'सर्वथा न न कंचन स्पृशन्ति शरीरधर्माणमुपतापाः'—कस्माद् ग्रन्थादेतत् वाक्यमुद्धृतम्—

(A) दशकुमारचरितात्   (B) हर्षचरितात्   (C) नैषधीयचरितात्   (D) कादम्बरीतः

25. 'इति हेतुस्तदुद्भवे' इति कस्य मतम्?

(A) जगन्नाथस्य   (B) हेमचन्द्रस्य   (C) वाग्भटस्य   (D) मम्मटस्य

26. उपमानोपमेयोः बिम्बप्रतिबिम्बत्वं चेत् कस्तत्रालङ्कारः?

(A) निदर्शनालङ्कारः   (B) दीपकालङ्कारः   (C) व्यतिरेकालङ्कारः   (D) दृष्टान्तालङ्कारः

27. ध्वनिप्रभेदेषु सर्वोत्कृष्टः कः?

(A) अलङ्कारध्वनिः   (B) भावध्वनिः   (C) रसध्वनिः   (D) वस्तुध्वनिः

28. "वितरति गुरुः प्राज्ञे विद्यां यथैव तथा जडे" इत्युक्तिः कस्मिन् नाटके आयाति?

(A) अभिज्ञानशकुन्तले   (B) मालतीमाधवे   (C) मालवकाग्निमित्रे   (D) उत्तररामचरिते

29. मुखसन्धेः अङ्गानि कति?

(A) द्वादश   (B) चतुर्दश   (C) त्रयोदश   (D) एकादश

30. मुद्राराक्षसनाटके मुद्रा केन सम्बद्धा भवति?

(A) मलयकेतुना   (B) चाणक्येन   (C) चन्द्रगुप्तेन   (D) राक्षसेन

31. नाट्यशास्त्रस्य 'अभिनवभारती' इति व्याख्याकर्ता कः?

(A) आनन्दवर्धनः   (B) भरतः   (C) अभिनवगुप्तः   (D)

धनञ्जयः

32. सात्त्विकभावानां संख्या भवति--

(A) त्रयस्त्रिंशत्   (B) नव   (C) अष्टौ   (D) अष्टादश

33. पण्डितराजजगन्नाथानुसारं सामान्यवस्तुध्वनिः गुणीभूतव्यंग्यप्रकाराश्च कस्मिन्काव्यप्रभेदेऽन्तर्भवन्ति?

(A) उत्तमोत्तमकाव्ये   (B) उत्तमकाव्ये   (C) मध्यमकाव्ये   (D) अधमकाव्ये

34. न्यायमतेन अर्थापत्तेः कस्मिन् प्रमाणेऽन्तर्भावः भवितुमर्हति?

(A) प्रत्यक्षे   (B) अनुमाने   (C) शब्दे   (D) उपमितौ

35. सादृश्यज्ञानकरणं ज्ञानं किमस्ति?

(A) प्रत्यक्षम्   (B) अनुमितिः   (C) शाब्दबोधः   (D) उपमितिः

36. विवर्तो विद्यते--

(A) कारणस्य कार्यावस्था   (B) कारणस्य समसत्ताकपरिणामः

(C) कारणगुणात्मिका कार्योत्पत्तिः   (D) अतत्त्वतोऽन्यथा प्रथा

37. 'सतः सत् जायते' इति कस्य मतम्?

(A) सांख्यस्य   (B) बौद्धस्य   (C) वेदान्तिनः   (D) नैयायिकस्य

38. कतिविधः बुद्धिसर्गः?

(A) त्रिविधः   (B) चतुर्विधः   (C) पञ्चधा   (D) सप्तधा

39. तदभाववति तत्प्रकारकं ज्ञानं कीदृशम्?

(A) प्रमा   (B) अप्रमा   (C) स्मृतिः   (D) संशयः

40. बुद्धेः का प्रकृतिः?

(A) अहङ्कारः   (B)पुरुषः   (C) मूलप्रकृतिः   (D) तन्मात्राणि

41. 'पाणिपादम्'–अस्मिन् पदे समासविग्रहः भवति—

(A) पाणी च पादौ च   (B) पाणिः च पादञ्च

(C) पाणिना च पादेन च   (D) पाणिं च पादौ च

42. कुक्कुटमयूर्यौ—इत्यस्य पदस्य लौकिकविग्रहः भवति—

(A) कुक्कुटश्च मयूरी च   (B) कुक्कुटञ्च मयूरञ्च

(C) कुक्कुटस्य च मयूर्या च   (D) कुक्कुटौ च मयूर्यौ च

43. अधोनिर्दिष्टानां समीचीनां तालिकां विचिनुत—

	(A)		(B)
(a) अभिनिविश्च		1. तुल्यास्यप्रयत्नम्	
(b) अपृक्त		2. बहुव्रीहिः	
(c) चित्रगुः		3. कर्म संज्ञा	
(d)सवर्णम्		4. एकाल् प्रत्ययः	

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

44. 'चौराद् विभेति' इत्यत्र अपादानं केन सूत्रेण विधीयते?

(A) पराजेरसोढः   (B)भीत्रार्थानां भयहेतुः

(C) वारणार्थानामीप्सितः   (D)विभाषा गुणेऽस्त्रियाम्

45. 'चर्मणि द्वीपिनं हन्ति'–इत्युदाहरणं कस्य भवति?

(A) निमित्तात् कर्मयोगे   (B)साध्वसाधुप्रयोगे च

(C) षष्ठी चानादरे च   (D)यतश्च निर्धारणम्

46. भारोपीयभाषापरिवारे केन्टुमवर्गस्य कति प्रमुखभेदाः?

    (A)चत्वारः   (B)सप्त   (C) नव   (D) एकादश

47. दशकुमारचरिते अयं प्रतिनायको भवति—

    (A) राजहंसः   (B) मानसारः   (C) राजवाहनः   (D) पुष्पोद्भवः

48. अमात्योत्पत्तिः कुत्र उपदिष्टा?

    (A) कण्टकशोधने   (B) धर्मस्थीये   (C) षाड्गुण्ये   (D)

विनयाधिकारिके

49. विवादेषूपदर्शितो व्यवहारो वर्तते—

    (A)एकपात्   (B) द्विपाद्   (C) त्रिपात्   (D) चतुष्पाद्

50. स्मृत्योर्विरोधे कः बलवान्?

    (A)व्यवहारः   (B) न्यायः   (C) राजा   (D) न्यायाधीशः

x-x-x

Sociology(1077)

1. "Population when unchecked increased in a geometrical ratio, subsistence increase in arithmetic ratio." Who proposed this?

    A) Spencer   B) Freud   C) Malthus   D) Darwin

2. Which of the following is closest to the meaning of Action Research?

    A) Participatory   B) Problem Solving   C) Interdisciplinary   D) Ethnographic

3. According to Critical theory, Sociology is _____ science:

    A) Value-free   B) Objective   C) Emancipatory   D) Social

4. Which of the following states had the lowest child sex ratio in 2011 census?

    A) Haryana   B) Bihar   C) Punjab   D) U.P.

5. Typification is a concept used in which of the following perspectives?

    A) Ethnomethodology   B) Symbolic Interactionism
    C) Phenomenology   D) Dramaturgy

6. Sociometry is associated with:

    A) Robert Park   B) J.L.Moreno   C) P. Geddes   D) Goode &Hatt

7. An instrument is said to be _____ when it gives same results repeatedly.

    A) Objective   B) Value-free   C) Reliable   D) Valid

8. _____ treats social reality as 'a-priori' truth.

    A) Constructivism   B) Objectivism   C) Empiricism   D) Interpretivism

9. Which of the following is a summated scale?

    A) Likert scale   B) Thurstone scale   C) Guttman scale   D) Bogardus scale

10. A complete list of units out of which final sample is selected is known as:

    A) Population   B) Universe   C) Census   D) Sampling frame

11. A positive correlation is indicated when:

    A) Two variables move in the same direction
    B) Two variables move in opposite direction
    C) One variable goes up and one goes down
    D) The two variables remain constant

12. Which of the following statistics measures the most frequently occurring value in a set of data?

A) Range   B) Median   C) Mean   D) Mode

13. Who introduced the concept of 'sociology of knowledge'?

A) Peter Berger   B) H. Garfinkel
C) Berger and Luckmann   D) Goffman

14. 'Accounting' is a key concept used in:

A) Ethnomethodology   B) Phenomenology
C) Critical theory   D) Positivism

15. Who among the following conducted the famous 'breaching experiments'?

A) G. Simmel   B) M. Weber   C) Garfinkel   D) T. Parsons

16. Which of the following is correctly matched?

A)   Public Sphere   -   Talcott Parsons
B)   G.S.Ghurye   -   Indological perspective
C)   Ritual Purity-Pollution   -   M.N.Srinivas
D)   Neo-functionalism   -   G.H.Mead

17. Who among the following called village community as a little community?

A) Robert Redfield   B) Henry Maine
C) Tonnies   D) Spencer

18. Who considers 'language as disorderly and unstable' in his concept of 'Deconstruction'?
A) Foucault   B) Giddens
C) Derrida   D) Jameson

19. Who introduced the concept of 'Culture of Poverty'?

A) Louis Dumont   B) Oscar Lewis
C) Karl Marx   D) Weber

20. What is the minimum calories intake of rural areas for defining poverty?

A) 2400   B) 2000   C) 2450   D) 2250

21. Who considered modernity as an unfinished project?

A) Derrida   B) Althusser   C) Habermas   D) Giddens

22. What according to Marx is the basis of capitalism?

A) Pursuit of profit   B) Large-scale production
C) Private property   D) money and credit

23. 'The caste is an enclosed class." Who among the following made this statement?

A) B.R. Ambedkar   B) Andre Beteille   C) G.S.Ghurye   D) Louis Dumont

24. The Weberian model of social stratification has been used in the study of Indian caste system by:

A) S.C.Dube   B) M.N.Srinivas   C) Andre Beteille   D) Yogendra Singh

25. Who among the following are associated with Indianization of sociology?

A) G.S. Ghurye; A.R. Desai; D.P. Mukherjee
B) G.S. Ghurye; T.K. Oommen; A.R. Desai
C) G.S. Ghurye; T.K. Oommen; A.K. Saran
D) G.S. Ghurye; A.K. Saran; D.P. Mukherjee

26. Who among the following argued that authority relations are the main cause of social conflict?

A) Coser   B) Dahrendorf   C) Marx   D) R. Collins

27. Which of the following statements about Induction and Deduction is correct?

A) Opposite to each other   B) Replaceable
C) Complimentary   D) All of these

28. The square of standard deviation is called:

A) Co-efficient   B) Range   C) Mean   D) Variance

29. Who wrote "Buddha and his Dhamma"?

A) A.R.Desai   B) B.R.Ambedkar
C) D. Hardiman   D) N.K.Bose

30. When was the Protection of women against Domestic Violence formulated?

A) 2004   B) 2005   C) 1999   D) 2000

31. "Equality is a dream". Who made this statement?

A) Gouldner   B) Fairchild   C) M. Castells   D) Giddens

32. Who used the term "Feminine Mystique"?

A) Margaret Mead   B) Jean Draze   C) Betty Friedan   D) J. Butler

33. Who studied Rampura village?

A) Louis Dumont   B) M.N.Srinivas   C) Surajit Sinha   D) S.C.Dubey

34. Who among the following followed "methodological collectivism"?

A) M. Weber   B) G.H. Mead   C) E. Durkheim   D) A. Schutz

(3)

35. Who among the following proposed to synthesize Weber and Durkheim, in theory of action?

   A) T. Parsons   B) R. Merton   C) H. Marcuse   D) H. Blumer

36. Who among the following studied village Bisipara and wrote "Caste and Economic Frontiers"?

   A) I.P. Desai   B) M.N. Srinivas   C) Andre Beteille   D) F.G. Bailey

37. The concept of 'Culture Industry' is associated with:

   A) H. Marcuse   B) Adorno   C) Gramsci   D) Habermas

38. Who among the following coined "Development of Underdevelopment"?

   A) Wallerstein   B) G. Myrdal   C) Rostow   D) A.G.Frank

39. Who among the following distinguishes modern society from earlier societies as "Risk Society"?

   A) J. Habermas   B) A. Gouldner   C) U. Beck   D) G. Ritzer

40. Who has classified religion and magic as sacred and science as unholy?

   A) T. Parsons   B) E. Durkheim   C) M. Weber   D) Malinowski

41. Who among the Post Structuralists focused upon the linkage between knowledge and power?

   A) Foucault   B) Derrida   C) Miller   D) Levi-Strauss

42. Frankfurt School is popularly associated with which of the following?

   A) Phenomenology   B) Dramaturgy   C) Neo-Marxism   D) Structuralism

43. "The Coming Crisis of Western Sociology" is authored by:

   A) A. Gouldner   B) A. Giddens   C) G. Ritzer   D) Foucault

44. What according to the post-modern thinkers constructs the social reality and the human world?

   A) Consciousness   B) Language   C) Interaction   D) Social Actions

45. Randomization is very crucial in which of the following research designs?

   A) Exploratory   B) Descriptive   C) Experimental   D) Longitudinal

46. Type of residence where married couples go to live with brother of the groom's mother?

   A) Patrilocal   B) Avunculocal   C) Neo-local   D) Matrilocal

47. The first significant contribution to the study of kinship was made by:

   A) R. Brown   B) Malinowski   C) I. Karve   D) Morgan

48. "Total institution" is a concept used by:

   A) H. Garfinkel   B) K. Marx   C) E. Goffman   D) T. Parsons

49. "Social Change in Modern India" is authored by:

   A) Yogendra Singh   B) M. N. Srinivas   C) Mandelbaum   D) T.K. Oommen

50. Who among the following is a proponent of dialectical approach to the study of Indian society?

   A) D.P. Mukherjee   B) M.N. Srinivas   C) A. Beteille   D) Y.B. Damle

x-x-x

Statistics (1077)

1. Let X_1, X_2 be independent random variables each having geometric distribution $q^x p$, $x = 0,1,2$ .... the conditional distribution of X_1 given $X_1 + X_2$ is
    A) Geometric   B) Exponential   C) Uniform   D) Binomial

2. A national achievement test is administered annually to 3rd graders. The test has a mean score of 100 and a standard deviation of 15. If Jane's z-score is 1.20, what was her score on the test?
    A) 82   B) 88   C) 118   D) 112

3. If the regression of y on x is perfectly linear then the variance of regression estimate is:
    A) Zero   B) one
    C) Between zero and one   D) Greater than one

4. Two unbiased dice are thrown. Find the conditional probability that two fives occur if it is known that the total is divisible by 5?
    (A) $\frac{7}{36}$ B) $\frac{7}{12}$ C) $\frac{1}{36}$ D) $\frac{1}{7}$

5. If $X_1, X_2, ..., X_k$ are independent and identically distributed random variables following geometric distribution. The distribution of $S_k = \sum_{j=1}^{k} X_j$ is
    A) Geometric   B) Poisson

    C) Negative binomial   D) Uniform

6. For a bivariate data set (X_i, Y_i), $i = 1, ..., n$. Suppose the least square regression lines are:
    5x – 8y + 14 = 0
    2x – 5y + 11 = 0
    Then which of the following statement is true?
    A) The value of correlation coefficient is 0.80
    B) The value of correlation coefficient is 0.50
    C) The value of correlation coefficient is 0.3
    D) The value of correlation coefficient is 1.0

7. Suppose that among six bolts two are shorter than a specified length. If two bolts are chosen at random, what is the probability that the two short bolts are picked?
    (A) $\frac{1}{6}$ B) $\frac{1}{15}$ C) $\frac{2}{15}$ D) $\frac{1}{3}$

8. Let the random variable X follows uniform distribution over (0,1). Then the distribution of the random variable $Y = -2\log X$ is
    A) Uniform   B) Beta   C) Chi-square   D) Logistic

9. If X is uniformly distributed with mean 1 and variance $\frac{4}{3}$. Then P[X<0] is given by

    A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{3}$ D) Zero

10. If $\underline{X} = (X_1, X_2)'$ and the marginal distributions of X_1 and X_2 are both univariate normal, then $\underline{X}$ has a bivariate normal distribution iff

    A) $X_1 + X_2$ is univariate normal

    B) $X_1 - X_2$ is univariate normal

    C) $l_1 X_1 + l_2 X_2$ is univariate normal for all real l_1 and l_2

    D) $l_1 X_1 - l_2 X_2$ is univariate normal for all real l_1 and l_2.

11. In case of 2^3 factorial experiment with one replicate, the treatment

Block-1	Block-2
1	(a)
(ab)	(b)
(ac)	(c)
(bc)	(abc)

    A) ABC is confounded   B) AC is confounded

    C) AB is confounded   D) BC is confounded

12. Let $\underline{X} \sim N(\underline{\mu}, \Sigma)$ Then the Characteristic Function of $Z = D\,\underline{X}$ for every real vector $\underline{t}$ is:

A) $e^{i\underline{t}'(D\underline{\mu}) - \frac{1}{2}\underline{t}'D\underline{t}}$

B) $e^{i\underline{t}'(D\underline{\mu}) - \frac{1}{2}\underline{t}'(D\Sigma D')\underline{t}}$

C) $e^{i\underline{t}'\mu - \frac{1}{2}\underline{t}'\Sigma\underline{t}}$

D) $e^{i\underline{t}'\mu - \frac{1}{2}\underline{t}'D\underline{t}}$

13. Suppose $[L(X), U(X)]$ is a 95% confidence interval for a population mean. Which of the following is true?

    (A) $P[L(X) \le \bar{X} \le U(X)] = 0.95$

    (B) $P[L(X) \le \bar{X} \le U(X)] = 0.05$

    (C) $P[L(X) \le \mu \le U(X)] = 0.95$

    (D) $P[X\ ) \le \mu \le U(X)] = 0.05$

14. The probability that a book on statistics will be favourable reviewed by 3 independent critics are 3/4, 4/7 and 2/5 respectively. What is the probability at least one of the reviews will be favorable.

    A) 0.9   B) 1   C) 0   D) 0.5

15. A box contains a white and b black balls; c balls are drawn one by one with replacement. The expectation of the number of white balls drawn is given by

(A) $\dfrac{a}{a+b}$ B) $\dfrac{b}{a+b}$ C) $\dfrac{a+b}{a-b}$ D) $\dfrac{ac}{a+b}$

16. If T is an unbiased and consistent estimator of θ then for θ^2, T^2 is

A) Unbiased and consistent   B) Unbiased and inconsistent

C) Biased and inconsistent   D) Biased and consistent

17. Let $f(x,y) = \begin{cases} 2, & 0 < x < y, 0 < y < 1 \\ 0, & o.w. \end{cases}$

be the joint probability density function of X and Y, then X and Y :

A) Are uncorrelated

B) Are correlated with coefficient of correlation $=1$

C) Are correlated with coefficient of correlation $=1/2$

D) Are correlated with coefficient of correlation $= 0.2$

18. If $r_{12} = 0.80$, $r_{13} = -0.40$ and $r_{23} = -0.56$, where r_{ij} denotes the correlation coefficient between X_i and X_j for i, j = 1, 2, 3. Then $r_{12.3}$ the partial correlation coefficient is given by

A) 0.96   B) 0.42   C) 0.65   D) 0.75

19. Suppose you have the following information about the cdf of a random variable X, which takes one of 4 possible values:

Value of X	1	2	3	4
Cdf	0.25	0.4	0.8	1

Which of the following is true?

A) $\Pr(X = 2) = 0.4$ B) $E(X) = 2.5$

C) $\Pr(X= 4) = 0.2$ D) $\Pr(X = 4) = 1$

20. In case of EWMA (Exponentially weighted Moving Average) control chart the steady state control limits are given by

A) $\mu_o \pm L\sigma \sqrt{\dfrac{2-\lambda}{\lambda}}$ B) $\mu_o \pm L \sqrt{\dfrac{\sigma\lambda}{2-\lambda}}$

C) $\mu_o \pm L\sigma \sqrt{\dfrac{\lambda}{2-\lambda}}$ D) $\mu_o \pm L \sqrt{\dfrac{(2-\lambda)\sigma}{\lambda}}$

Where L = width of the central limits & $0 < \lambda \le 1$

21. For the game with the following pay-off matrix, the value of the game is

$$P_1\begin{matrix} & P2 \\ \begin{bmatrix} 5 & 1 \\ 3 & 4 \end{bmatrix}\end{matrix}$$

A) $\dfrac{3}{5}$ B) $\dfrac{17}{5}$ C) $\dfrac{5}{17}$ D) $\dfrac{8}{17}$

22. A random sample of 1000 people was taken. Four hundred fifty of the people in the sample favoured Candidate A. The 95% confidence interval for the true proportion of people who favours Candidate A is

    A) 0.419 to 0.481   B) 0.40 to 0.50   C) 0.45 to 0.55   D) 1.645 to 1.96

23. A simple random sample of 100 observations was taken from a large population. The sample mean and the standard deviation were determined to be 80 and 12 respectively. The standard error of the mean is

    A) 1.20   B) 0.12   C) 8.00   D) 0.80

24. Let X be a binomial variate with mean 2 and variance 1, Then the probability that X takes value at least 1 is

    A) $\dfrac{2}{3}$ B) $\dfrac{4}{15}$ C) $\dfrac{7}{8}$ D) $\dfrac{15}{16}$

25. In Multivariate analysis, first canonical variates is a linear combination of variates having
    A) Minimum variance   B) Maximum variance
    C) Minimum correlation   D) Maximum correlation

26. In case of $\overline{X}$ Chart. The average run length ARL is given by

    A) $\beta\,(1 - \beta)$ B) $\dfrac{1}{(1-\beta)^2}$

    C) $\beta(1\text{-}\beta)^2$ D) $\dfrac{1}{1-\beta}$

    Where β is the probability of not detecting a shift in the mean in first subsequent sample.

27. Let $\underline{X}$ be 4x1 random vector with multivariate normal distribution with mean $\underline{\mu}$ and dispersion matrix Σ. Suppose the eigen values of Σ are $\lambda_1 = 6, \lambda_2 = 3, \lambda_3 = 2, \quad \lambda_4 = 1$

    Which of the following statement is correct?

    A) The percentage of variation explained by first component is < 20%.

    B) The percentage of variation explained by first two components is < 50%.

C) The percentage of variation explained by first three components is $< 95\%$.

D) The percentage of variation explained by first three components is $> 95\%$.

28. Let (x_i, y_i) be the n pair of values of x and y, then how many lines can pass through the plot of (x_i, y_i)'s ?

A) One line B) Two lines
C) n lines D) More than n lines

29. Let Y_1, Y_2, Y_3, Y_4 be i.i.d. standard normal variables. Which of the following is wishart with 2 d.f.?

A) $\begin{bmatrix} Y_1^2 + Y_2^2 & Y_2^2 + Y_3^2 \\ Y_2^2 + Y_3^2 & Y_3^2 + Y_4^2 \end{bmatrix}$

B) $\begin{bmatrix} Y_1^2 & Y_2^2 \\ Y_3^2 & Y_4^2 \end{bmatrix}$

C) $\begin{bmatrix} Y_1^2 + Y_2^2 & 0 \\ 0 & Y_3^2 + Y_4^2 \end{bmatrix}$

D) $\begin{bmatrix} Y_1^2 + Y_2^2 & Y_1 Y_3 + Y_2 Y_4 \\ Y_1 Y_3 + Y_2 Y_4 & Y_3^2 + Y_4^2 \end{bmatrix}$

30. Let C_p denote the process capability Ratio $C_P = \dfrac{USL - LSL}{6\sigma}$. Then $C_p > 1$ it implies

A) The process uses up more than 100% of the tolerance band.

B) The process uses much less than 100% of the tolerance band

C) The process uses up all the tolerance band

D) The process uses more than 200% of the tolerance band

31. The necessary condition for the BIBD with parameters (v, r, b, k) with v even to be SBIBD is that

A) $(r - k)$ must be a perfect square B) $(r - \lambda)$ must be a perfect square

C) $(k - \lambda)$ must be a perfect square D) $(N - \lambda)$ must be a perfect square

Where N is the incidence matrix of BIBD and λ is the inner product of any two rows of N.

32. Identify the correct answer
A) The type- A OC always lie below the type -B OC curve

B) The Type-A OC curve will always lie above the type -B OC curve.

C) The type -A OC curve will always cross the type -B OC curve from above

D) The Type-A OC curve will always cross the type-B OC curve from below

33. Suppose $Y_1, Y_2, \ldots$ are random variables on a common probability space with $Y_n \sim N(\mu, \sigma^2)$.

Then Y_n converges in probability to 2 iff

A) $\mu \to 0$ and $\sigma^2 \to 2$ 　　　　　　　　　　　　B) $\mu \to 2$ and $\sigma^2 \to 0$

C) $\mu \to 0$ and $\sigma^2 \to 1$ 　　　　　　　　　　　　D) $\mu \to 1$ and $\sigma^2 \to 2$

34. Consider the Linear programming problem
Maximize: z = -2x-5y

Subject to $3x + 4y \geq 5$, $x \geq 0$, $y \geq 0$.

Which of the following is correct ?

A) Set of feasible solutions is empty

B) Set of feasible solutions is non empty but there is no optimal solution

C) Optimal value is (0, 5/4)

D) Optimal value is (5/3, 0)

35. If A1, A$_2$,…,A$_q$ are independently distributed with A$_i$ distributed according to W(Σ , n$_i$).

then $A = \sum\limits_{i=1}^{q} A_i$ is distributed according to

A) χ^2 with q d.f 　　　　　　　　　　　　B) χ^2 with $\left(\sum\limits_{i=1}^{q} n_i\right)$ d.f

C) $W\left(\Sigma, \sum\limits_{i=1}^{q} n_i\right)$ 　　　　　　　　　　　　D) $W\left(\Sigma, n\right)$

36. If in a block the number of experimental units or plots is smaller than the number of treatments, then the design so constituted is called

A) CRD 　　　　　　　　　　　　B) Orthogonal Design

C) Connected Design 　　　　　　　　　　　　D) Incomplete Block Design

37. Let $X_1, X_2, \ldots, X_n$ be a random sample from uniform $(0, 5\theta), \theta > 0$. Define $X_{(1)} = \min\{X_1, X_2, \ldots, X_n\}$ and $X_{(n)} = \max\{X_1, X_2, \ldots, X_n\}$. Maximum likelihood estimator of θ is

A) $\frac{X_{(1)}}{5}$ 　　　　　　B) $X_{(n)}$ 　　　　　　C) $X_{(1)}$ 　　　　　　D) $\frac{X_{(n)}}{5}$

38. In case of linear programming, if either the primal or the dual problem has an unbounded objective function value, then the other problem has

A) Unbounded solution

B) No feasible solution

C) Multiple solutions

D) Unique feasible solution

39. A Poisson distribution has a double mode at $x = 3$ and $x = 4$ .Identify the correct answer

A) The probability that $x = 4$ is $\frac{32}{3} e^{-4}$

B) The probability that $x = 3$ or $x = 4$ is $\frac{32}{3} e^{-4}$

C) The probability that $x = 3$ or $x = 4$ is $\frac{64}{3} e^{-4}$

D) The probability that $x = 3$ or $x = 4$ is 1

40. Ten balls are put in 6 slots at random. Then the expected total number of balls in two extreme slots is

A) 10/6   B) 10/3   C) 1/6   D) 6/10

41. If $X \sim B(n, p)$, then $E\left(\frac{X}{n} - p\right)^2$ is

(A) $\frac{q}{n}$ B) pq C) npq D) $\frac{pq}{n}$

42. In case of CRD, where v treatments are applied to n experimental units such that i^{th} unit is replicated r_i times, the variance of treatment contrasts $\underline{l}'\underline{t}$ is given by:

A) $\sigma^2 \left(\frac{1}{r_i} - \frac{1}{r_j}\right)$

B) $\sigma^2 \left(\frac{1}{r_i^2} - \frac{1}{r_j^2}\right)$

C) $\sigma^2 \left(\frac{1}{r_i} + \frac{1}{r_j} - 2r_i r_j\right)$

D) $\sigma^2 \left(\frac{1}{r_i} + \frac{1}{r_j}\right)$

43. The Arithmetic Mean of (positive) regression coefficients of two variables is

A) Equal to their correlation coefficient

B) Half of their correlation coefficient

C) Less than their correlation coefficient

D) Greater than their correlation coefficient

44. Let r be the observed correlation coefficient in a sample of n pairs of observations from a bivariate normal population, then to test the null hypothesis, that the population correlation coefficient is zero, where d.f= degrees of freedom, the test statistic to be used is:

A) $t = \frac{r}{\sqrt{1-r^2}}\sqrt{n-1} \sim t_{(n-1)}d.f$

B) $t = \frac{r}{\sqrt{1-r^2}}\sqrt{n-2} \sim t_{(n-2)}d.f$

C) $t = \frac{r}{\sqrt{n-2}}\sqrt{1-r^2} \sim t_{(n-2)}d.f$

D) $t = \frac{r}{\sqrt{1-r^2}}\sqrt{n-2} \sim t_{(n-1)}d.f$

45. Let $\underline{X}$ be px1 random vector with multivariate normal distribution with mean $\underline{0}$ and dispersion matrix Σ where rank $(\Sigma) = p$. Which of the following statement is true?

A) $E(\underline{X}'\Sigma^{-1}\underline{X}) = p$, $V(\underline{X}'\Sigma^{-1}\underline{X}) = p$

B) $E(\underline{X}'\Sigma^{-1}\underline{X}) = 2p$, $V(\underline{X}'\Sigma^{-1}\underline{X}) = 2p$

C) $E(\underline{X}'\Sigma^{-1}\underline{X}) = p$, $V(\underline{X}'\Sigma^{-1}\underline{X}) = 2p$

D) $E(\underline{X}'\Sigma^{-1}\underline{X}) = 2p$, $V(\underline{X}'\Sigma^{-1}\underline{X}) = p$

46. Let X be a continuous random variable with p.d.f. and c.d.f. F. Let $X_1, X_2, \ldots, X_n$ be a random sample of X and M be the maximum of the sample. Then the p.d.f. of M is given by

A) $n(F(m))^{n-1}f(m)$

B) $n(F(m))^{m-1}f(m)^n$

C) $(F(m))^n f(m)^{n-1}$

D) $mnF(m)(f(m))^{n-1}$

47. Consider the model $Y_i = i\beta + \varepsilon_i$, $i = 1,2,3$ wher $\varepsilon_1, \varepsilon_2, \varepsilon_3$ are independent with mean 0 and variance $\sigma^2, 2\sigma^2, 3\sigma^2$ respectively. Which of the following is the best linear unbiased estimate of β?

A) $\frac{y_1+2y_2+3y_3}{6}$

B) $\frac{6}{11}\left(y_1 + \frac{y_2}{2} + \frac{y_3}{3}\right)$

C) $\frac{y_1+y_2+y_3}{6}$

D) $\frac{3y_1+2y_2+y_3}{10}$

48. Suppose there are k strata of $N = kM$ units each with size M. Draw a sample of size n_i with replacement from the ith stratum and denote by $\bar{y}_i$ the sample mean of the study variable selected in the ith stratum, $i = 1, 2, \ldots, k$.

Define

$$\bar{y}_s = \frac{1}{k}\sum_{i=1}^{k} \bar{y}_i \quad \text{and} \quad \bar{y}_w = \frac{\sum_{i=1}^{n} n_i\bar{y}_i}{n}$$

Which of the following is necessarily true?

A) $\bar{y}_s$ is unbiased but $\bar{y}_w$ is not unbiased for population mean

B) $\bar{y}_s$ is not unbiased but $\bar{y}_w$ is unbiased for population mean

C) Both $\bar{y}_s$ and $\bar{y}_w$ are unbiased for population mean

D) Neither $\bar{y}_s$ nor $\bar{y}_w$ are unbiased for population mean

49. Let X be a random variable which is symmetric about 0. Let F be the cumulative distribution function of X. Which of the following statement is true?

(A) $F(x) + F(-x) = 1 \ \ for \ all \ x \in R.$

(B) $F(x) - F(-x) = 0 \ \ for \ all \ x \in R.$

(C) $F(x) + F(-x) = 1 + P(X = x) \ for \ all \ x \in R.$

(D) $F(x) + F(-x) = 1 - P(X = -x) \ for \ all \ x \in R.$

50. Let $X_i's$ be independent random variable such that $X_i's$ are symmetric about 0 and $Var(X_i) = 2i - 1 \ for \ i \geq 1.$ Then $\lim_{n\to\infty} P(X_1 + X_2 + \cdots + X_n > n \log n)$

A) Does not exist   B) Equals $\frac{1}{2}$.

C) Equals 1   D) Equals 0

x-x-x

Stem Cell Tissue Engineering & Biomedical Excellence(Ph.D)   (1077)

1. The Barret's oesophagus is due to which one of the following:-

    A) Conversion of stratified squamous epithelial cells to columnar epithelial cells due to acid
    B) Conversion of columnar epithelial cells to stratified squamous epithelial cells due to acid
    C) Conversion of stratified squamous epithelial cells to columnar epithelial cells due to alkali
    D) Conversion of columnar epithelial cells to stratified squamous epithelial cells due to alkali

2. The hepatic oval cell when grown in presence of 23 mM Glucose led to formation of a cell that expresses glucagon. Which of the following best explain this character?

    A) Antisense activation of insulin led to glucagon expression in these cells
    B) It is an artifact of *in vitro* cell culture
    C) It is simply due to the fact that hepatic oval cells also contain pancreatic progenitors
    D) Transdifferentiation of liver progenitors to pancreatic lineage

3. Trophoectoderm possesses which of the following character.

    A) Totipotential   B) Pleuripotential
    C) Mutlipotential   D) Metastatic

4. How would you classify primitive endoderm?

    A) One of the germ layer that contributes to endodermal tissues like gut, liver or pancreas
    B) A germ layer that contributes to ectodermal tissues like skin
    C) An extraembryonic lineage that forms part of the yolk sac
    D) Neonatal structure formed prior to germ lineage differentiation

5. You accidently injected primodial germ cells in a nude mice that resulted in formation of a structure that contained cells of all the three germ layer cell, what would be your inference about the result;

    A) The structure so generated was an post implantation egg
    B) The structure so generated was teratoma
    C) The structure so generated was blastomere
    D) The structure so generated was blstocyst

6. During *Drosophila* development the structure that contains multiple nuclei bathing in the same cytoplasm is termed as:

    A) Syntial blastoderm   B) Cellular blastoderm
    C) Cocoon   D) Larva

7. All except, one of the following are used in regulating protein levels in stem cells.

    A) Epigentic mechanism at gene level
    B) Salting in at protein level

C) Covalent modification at protein level

D) Antisense mechanism at translational level

8. All, except one, are not Yamanaka factors;

A) OCT 3/4, Sox2, KIF4, c-Myc

B) OCT 3/4, Nanog, KIF4, HIF1

C) OCT 3/4, Nanog, HIF1, c-Myc

D) OCT 3/4, Sox2, Nanog, HIF1,

9. By exploiting which of the following compound you would show that cell differenation was dependent upon G-proteins regulating cAMP signaling

A) Cholera Toxin

B) Shigella toxin

C) Death cup toxin

D) Viral toxin

10. Which of the following was found to be down regulated, when LIF Factor was removed out of the stem cells growing on plate?

A) Specific transcription factor augmenting translation

B) Signal transducer and activator of transcription

C) Signal transducer and activator of translation

D) Signaling together for activating transgene.

11. Which one of the following is not associated with altering the morphogenesis?

A) Bicoid

B) Nanos

C) Decapentaplegic

D) Nuclear factor Kappa B

12. You were asked to determine the neurogenic region of the forebrain. Using neural stem cell marker you have identified one region that would be represented as;

A) Subventricular zone

B) Subaurical zone

C) Trigeminal ganglia

D) Pituitary zone

13. You were provided with three sets of embryonic stem cells samples from mouse, Non-human primate and human and were asked to specify which combination provides the right source based on presence of SSEA-1 marker expression.

A) Mouse embryonic stem cells and Human embryonic stem cells

B) Mouse embryonic stem cells and Non-human Primate embryonic stem cells

C) Human embryonic stem cells and Non-human Primate embryonic stem cells

D) Mouse, Human and Non-human Primate embryonic stem cells

14. Mitomycin additions to primary mouse embryonic fibroblasts lead to which of the following effect.

A) Mitotically proliferate mouse embryonic fibroblasts (MEFs) for use as feeder cell layers

B) Mitotically inactivates mouse embryonic fibroblasts (MEFs) for use as feeder cell layers

C) Meiotically inactivates mouse embryonic fibroblasts (MEFs) for use as feeder cell layers

D) Meiotically Proliferate mouse embryonic fibroblasts (MEFs) for use as feeder cell layers

15. During the derivation of human embryonic stem cells the immuno-surgical method is commonly used based on removing the zona pellucida with acidic tyrode solution. The ICM cells are then isolated by which of the following ways;

   A) Through directing an Antibody that binds trophectoderm layer, which can then be lysed with complement system to free ICM cells
   B) Through directing an Antibody that binds ICM cells and trohphoectodem is removed by laser to free ICM Cells
   C) Through directing an Antibody that binds Albumin on the embryo followed by sonication to get rid of trophoectoderm to get ICM Cells
   D) Through directing Fluorescence antibody that forms track on embryo where ICM cells are present and microsurgery is performed to retrieve ICM Cells

16. Exposing mesenchymal cells to condition media from adipocytes cells   differentiated the mesenchymal cells to adipogenic lineage, however prior   incubation of the condition media to 60^0C followed by cooling prevented the   adipogenic differentiation of mesenchymal stem cells. The adipogenic differentiation components seems to possess which of the following component

   A) Calcium   B) Protein
   C) Antisense RNA   D) Sense RNA

17. Treatment of mesenchymal stem cells with methylating agent produced changes in the methylation pattern in cell cycle regulatory protein. To check the sites which get methylation, you opted for a sequencing reaction based on which one of the following strategy.

   A) Bisulfite sequencing   B) Pyrosequencing
   C) Dideoxy sequencing   D) Sanger sequencing

18. Injecting embryonic stem cell into the blastocyst of different genotype would create which one of the following organism.

   A) Premature destruction of embryo   B) Wild type
   C) Chimera   D) Cheprone

19. You have generated an antibody in rabbit and labelled it as primary antibody. You used this antibody to identify the antigen in a differentiated stem cell. However, to identify that antigen on these differentiated cells you are asked to use secondary antibody fused to fluorescence marker. The secondary antibody that you will use would be generated in any of the following organisms, except one;

   A) Donkey   B) Rabbit   C) Goat   D) Horse

20. Over expression of *piwi* protein in soma leads to an increase in the germ stem cells (GSC) in the drosophila germarium. This action of *piwi* is represented as;

   A) GSC self renewal   B) GSC differentiation
   C) GSC transdifferentiation   D) GSC metaplasia

21. All, except one of the following are the niche regulators for the stem cells.

   A) *Piwi* protein   B) Cell cell contact proteins
   C) Local microenvironment   D) Protein kinase A

22. During gene transcription formation of polyribosome is an important way to achieve which of the following.

    A) To synthesize multiple proteins in short duration
    B) To make single protein in a fastest manner
    C) To prevent clogging of cells with ribosomes
    D) To edit the protein so that right type of protein is formed

23. You are asked to clone a gene using a natural plasmid, which of the following is the best choice out of the following;

    A) YAC   B) BAC   C) 2μm circle   D) Fosemid

24. All of the following statements are true for G Protein –coupled receptors, except;

    A) Each receptor has seven trans membrane α helical regions
    B) Each receptor has four extracellular and four cytosolic segments.
    C) Each receptor has a topology with N- terminus on cytosolic side and C-terminal on exoplasmic face
    D) In each receptor C2, C3 and C4 loops are involved in interactions with coupled trimeric G-Protein

25. In the humans epidermal growth factor Receptor (HER) family which of the following statements is true.

    A) HER are cytokine receptors
    B) Each receptor member can also activate trimetric G protein
    C) HER2 member of this family does not bind to ligand directly but exists in pre-activated state.
    D) HER 5 member is activated by four set of ligands

26. A final confirmation of the protein to give its function was dependent upon the attachment of mannose and galacatose residue to the proteins. This protein was rightfully translated. However, absence of functional activity of this protein confirmed which of the following, with respect to non attachment of the aforementioned sugar molecules.

    A) Aberration at the function of Golgi Apparatus
    B) Aberration at the function of mitochondria
    C) Aberration at the function of nucleus
    D) Aberration at the function of smooth endoplasmic reticulum

27. The Poly A tail is added to 3'mRNA of eukaryotes occur in which of the organelle the following;

    A) Nucleus   B) Mitochondria   C) Peroxisomes   D) Ribosomes

28. Which of the following cues in niche would maintain stem cells in undifferentiated state?

    A) Absence of LIF   B) Hypoxia
    C) A neutral pH   D) Aerobic condition

29. The cells isolated from twins for regenerative medicine would be called;

    A) Allogenic cells   B) Xenogenic cells

    C) Syngenic cells   D) Autogenic cells

30. Epithelial cells are interconnected by all of the following, except;

    A) Cohesins   B) Adherens junctions

    C) Hemidesmosomes   D) Desomosomes

31. Stem cells are differentiated to cell types that produce B and T cells, which of the following is their site of formation;

    A) Lymph nodes   B) Spleen

    C) Thyroid gland   D) Bone marrow

32. Hybridization techniques mentioned below permit detection of specific DNA fragments and mRNAs, except;

    A) Far –western blotting   B) Southern blotting

    C) Northen blotting   D) In-situ hybridization

33. The immunoglobin light chain families κ and λ, are constituted by which set of genes

    A) V and J genes only   B) V and Cgenes only

    C) V , J and C genes only   D) V , J , D and C genes only

34. The Stem cell regulatory body in India designated as NAC-SCRT stands for which of the following:

    A) National Association Controlling Stem Cell Research and translation

    B) National Accreditation Committee for stem cell regeneration and translation

    C) National Accounting Committee for Stem Cell Research and Therapy

    D) National Apex Committee for Stem Cell Research and Therapy

35. The *in vitro* culturing methodology used in the propogation of neural stem cells is represented by which of the following:

    A) Neurospheres   B) Neural tube

    C) Neuronal synapse   D) Trigeminal Neurons

36. The primitive streak represents which of the following:-

    A) Site of implantation of fertilized egg

    B) Streak appearing upon expansion of neural tube

    C) Initial band of cells from which the embryo begins to develop

    D) The line of demarcation where sperm makes entry in egg

37. During Electrophoretic mobility shift assay, the supershift occur due which of the following:

    A) Opening of DNA protein complex retards the movement

    B) Binding of antibody to the specific protein bound to DNA

    C) Loss of compactness of DNA molecule due to denaturation

    D) Denaturation of contaminating proteins

38. The stacking of bands during electrophoresis is the outcome of which of the following process;

    A) Isotachophoresis   B) Isoelectrophoresis

    C) Electrodynamic movement   D) Isoelctrofocussing

39. What is the percentage of CO_2 you would use in an incubator for growing animal cells in culture?

    A) 5%   B) 95 %   C) 10%   D) 37%

40. What types of filter would you use in the laminar Air flow in case the air being blown is turning out to be contaminated;

    A) Hyper Efficiency Particular Air   B) High Efficiency Partition Air

    C) Hyper Efficient Particle Air   D) High Efficiency Particulate Air

41. Which one of the following set can be used both for the mutagenesis and morphogenesis respectively:

    A) UV rays & Bicoid   B) UV rays NFkB

    C) UV rays & myoglobin   D) UV rays & albumin

42. The presence of aspartic acid amino acid was found to be important for the enzymatic activity of an enzyme X, however, mutation at gene level changed this aspartic acid to serine leading to loss of function of this enzyme. A covalent modification of this amino acid brought back the enzymatic activity of this mutated protein. Which one of the following covalent modification you think have restored the enzymatic activity?

    A) Methylation   B) Phopsporylation

    C) Acetylation   D) Isoperenylation

43. Upon denaturation of double stranded DNA there is a net increase in the absorbance value that continue to increase further when these denatured fragments are converted to smaller fragments. This phenomenon you would refer to which of the following;

    A) Hypochromic shift   B) Hypothetical shift

    C) Hyperchromic shift   D) Hyperactive shift

44. In flowcytometry, there is one category of cells from the testicular tissue those have been identified to show higher efflux of DNA-binding dye Hoechst 33342. These cells are being represented as:

    A) Cell in senescence state   B) Transiently amplifying cells

    C) Side population cells   D) Differentiated cells

45. A methodology for creating an animal that is genetically identical to a donor animal through somatic cell nuclear transfer is referred to as:

    A) Reproductive cloning   B) Therapeutic cloning

    C) Natural Reproduction   D) Gene cloning

46. Differential expression of an allele depending upon maternal versus paternal inheritance is defined as;

   A) Genetic imprinting
   B) Genetic interaction
   C) Genetic imbalance
   D) Genetic inheritance

47. DNMT3A and DNMT3B are DNA methyl transferase performing which type of function:

   A) Maintenance methyltransferase
   B) Recovery methyltransferases
   C) Denovo methyltansferases
   D) Chromatin modifying methyltransferases

48. You have transfected a gene of insert in stem cells that got episomally localized. The gene did show expression till 72 hrs then all of sudden the expression got completely lost, which of the following best represents the type of transfection;

   A) Stable transfection
   B) Transient transfection
   C) Gradient transfection
   D) Unstable transfection

49. Which one of the following is effective in destroying intracellular pathogen

   A) B cells
   B) Natural killer cells
   C) Antibodies
   D) Complement

50. One of the following represents as a reporter gene for analysing the promoter activity.

   A) Luciferase
   B) Deoxyribonuclaease
   C) Protease
   D) Ribonuclease

x-x-x

System Biology & Bioinformatics(Ph.D.)   (1077)

1. An enzyme catalyzed reaction has a K_M of 1mM and a V_{max} of 5nM.s^{-1}. What is the reaction velocity when [S] concentration is 0.25mM.

   A) 0.25 nM.s^{-1} B) 0.50 nM.s^{-1} C) 1.00 nM.s^{-1} D) 5.00 nM.s^{-1}

2. In order to identify the set of genes coordinately regulated, which of the following approaches in microarray experiments are applied.
   A) Cluster analysis   B) Loess analysis
   C) Lowess analysis   D) Quantile analysis

3. Which set of models mentioned here belongs to the nucleotide substitution models used in Phylogenetics tree construction.

   A) Jukes-Cantor and Kimura Model
   B) Jukes-Cantor and Markov model
   C) Markov and Kimura Model
   D) Jukes-Cantor, Markov and Kimura Model

4. In order to create all possible tree topologies for three taxa, how many unrooted and rooted trees will be generated.

   A) One Unrooted and One Rooted   B) Three Unrooted and Three Rooted
   C) Three Unrooted and One Rooted   D) One Unrooted and Three Rooted

5. Which of the following mentioned set of formats can provide information for complicated protein structural data
   A) GIF, MMDB and PDB   B) TIFF, MMDB and PDB
   C) mmCIF, MMDB and PDB   D) mmCIF, MMDB and GIF

6. Which of the following statements is not true for Vaccinia virus?

   A) It has been used in the form of live vaccine for small pox eradication.
   B) It has a double stranded DNA genome.
   C) Vaccinia virus DNA replicates in the nucleus of the host cell.
   D) Vaccinia virus DNA contains genes for DNA polymerase and RNA polymerase also.

7. Two protein sequences that diverged as a result of gene duplication with in a species will be termed as
   A) Paralogous   B) Orthologous
   C) Analgous   D) Heterologous

8. Fatty acids that predominate in phospholipids have been listed below. Identify which one of these is unsaturated
   A) Myristic acid   B) Palmitic acid
   C) Stearic acid   D) Linoleic acid

9. The term Euchromatin describes the

   A) Regions of chromatin that remain highly condensed and transcriptionally inactive during interphase
   B) Regions of chromatin that remain highly condensed and transcriptionally active during interphase
   C) Regions of chromatin that remain loosely condensed and transcriptionally inactive during interphase
   D) Regions of chromatin that remain loosely condensed and transcriptionally active during interphase

10. The side chains of a pair of amino acids generated an ionic bond (-COO⁻ -- ^+H_3N-), Identify the correct pair from the sets mentioned below

   A) Asp:Lys   B) Asp:Cys   C) Asp:Ser   D) Asp:Glu

11. The following are the examples of interactive molecular visualization tools for protein structure, except.

   A) Cn3D   B) Rasmol   C) WebMol   D) Paircoil2

12. The monoclonal antibody producing hybridoma cells need which of the following components in medium for selection and propagation.

   A) Hypoxanthine, Adenine and Thymidine
   B) Hypoxanthine, Aminodine and Thymidine
   C) Hypoxanthine, Aminopterin and Tyrosine
   D) Hypoxanthine, Aminopterin and Thymidine

13. Hub proteins in the protein –protein interaction networks are

   A) Proteins that occur at nodes and are highly connected within a protein network
   B) Proteins that occur at edges and are highly connected within a protein network
   C) Proteins that occur at nodes and are sparsely connected within a protein network
   D) Proteins that occur at edges and are sparsely connected within a protein network

14. The contiguous stretch of a sequence within a cloned sequence that does not contain a gap, vector or other contaminating sequences is termed as

   A) The finished sequence   B) Fragment
   C) Contig   D) Scaffold

15. You have a protein sequence for predicting its structure. BLAST and PSI-BLAST searches reveal that most closely related proteins with known structures have 15% identity to the query protein. In order to make the *in silico* prediction of the structure which of the options is best?

   A) X-ray Crystallography
   B) NMR
   C) Submit the sequence to a protein structure prediction server for homology modeling
   D) Submit the sequence to a protein structure prediction server for *ab-initio* modeling

16. A genetic characteristic in which characters are inherited from non-genomic genes is described as

A) Cytoplasmic
B) Transcriptomic
C) Translational
D) Post-translational

17. Position specific scoring matrix provides the

A) Log odds score for finding a particular matching amino acid in a target sequence
B) Log even score for finding a particular matching amino acid in a target sequence
C) Antilog odds score for finding a particular matching amino acid in a target sequence
D) Antilog odds score for finding a particular matching amino acid in a target sequence

18. The gene finding algorithms show difficulty in finding gene of non-coding RNAs due to the following reasons, except.

A) They are not poly adenylated
B) They are small in size
C) They lack open reading frame
D) They are found only in cDNA libraries

19. Which of the following is a synonym term of an operational taxonomic unit in a Phylogenetic tree.

A) Terminal Node
B) External branch
C) Internal Branch
D) Root

20. The accession number of Human Beta Globin protein provided was NP_000509.1. Which of the following statement is true about this number?

A) It provides the number of amino acids in the sequence
B) It is a RefSeq Accession number
C) It is a PDB accession number
D) It is Gene ID number

21. The structure of globular protein was elucidated by *Ab-initio* approach. In order to qualify as a good protein structure model, it must meet the following criteria, except.

A) Minimize the number of torsion angles in disallowed regions of the Ramachandran plot
B) Minimize the number of exposed hydrophobic residues
C) Minimize the number of interstitial cavities
D) Minimize the number of hydrogen bonds

22. Which of the following is not a optical disk category of secondary storage devices

A) Compact disc
B) Blu-ray disk
C) Digital Versatile disk
D) Floppy disk

23. Majority of compounds showing "Drug like properties" follow Lipinski's rule of 5. The following features are covered in this category, except.

A) Molecular weight < 500AMU
B) Log P below 5
C) Greater than 5 hydrogen bond donors
D) Fewer than 10 hydrogen bond acceptors

24. A computer network, spanning over a large geographical area is termed as

   A) WAN   B) LAN   C) RAM   D) ROM

25. Which of the following is not a basic type of database model

   A) Hierarchical   B) Relational   C) Object oriented   D) Divisive

26. Which is the correct choice of Phase of sample for NMR and X-ray crystallography.

   A) Liquid and Solid respectively   B) Solid and Liquid respectively
   C) Liquid for both the techniques   D) Solid for both the techniques

27. The term 'Spooling' in an operating system refers to

   A) Systematic peripheral operation online
   B) Simultaneous peripheral operation online
   C) Simultaneous performing operation online
   D) Systematic performing operation online

28. In following set of listed compounds all are either fluorescent or chemiluminescent, except

   A) Tyrosine, Ethidium bromide and Luminol
   B) Tryptophan, Ethidium bromide and Luminol
   C) Rhodamine, Ethidium bromide and Luminol
   D) Alanine, Ethidium bromide and Luminol

29. The BLAST p algorithm compiles a list of "words" defined as "Hits", which can be used for one of following approaches;

   A) Scan a database for exact matches
   B) Scan a database for partial matches
   C) Scan a database for exact and partial matches
   D) Scan a database for any random matches

30. Who have provided the most rigorous algorithm for pairwise local alignment of protein and DNA sequences.

   A) Smith and Waterman Algorithm
   B) Needleman and Wunsch Algorithm
   C) Smith and Wunsch Algorithm
   D) Needleman and Waterman Algorithm

31. The bioinformatics approaches mentioned here are multiple sequence alignment approaches, except.

   A) Clustal W   B) MUSCLE   C) PRALINE   D) MASCOT

32. Which type of radioactive particles are emitted by ^{14}C and ^{3}H isotope

   A) First Gamma followed by beta particles
   B) Beta particles and Gamma particles respectively
   C) Gamma particles only
   D) Beta Particles only

33. The number of SDS molecules that bind to protein molecules during SDS-PAGE is;

    A) 1.4gSDS/1.0g protein   B) 1.4gSDS/1.4g protein
    C) 1.0gSDS/1.0g protein   D) 1.0gSDS/1.4g protein

34. Identify which of the following proteins can acquire quaternary level of structure

    A) Insulin   B) Myoglobin
    C) Hemoglobin   D) Ribonuclease H

35. Formation of lariat structure during splicing mechanism represents which of the following activity

    A) An autocatalytic   B) ATP dependent splicase enzyme
    C) Chaperon based activity   D) Ligase enzyme activity

36. The ages of the 10 subjects in a study were
    $x_1 = 42$, $x_2 = 28$, $x_3 = 28$, $x_4 = 61$, $x_5 = 31$,
    $x_6 = 23$, $x_7 = 50$, $x_8 = 34$, $x_9 = 32$, $x_{10} = 37$
    The mean age and median age of this dataset would be.

    A) 36.6 and 33 respectively   B) 33 and 36.6 respectively
    C) 36and 33.6 respectively   D) 33.6 and 36 respectively

37. Which one of the following statement is a true description of structure of α- keratin molecule

    A) It is a coiled-coil β helical structure
    B) It is a random coil β helical structure
    C) It is a coiled-coil α helical structure
    D) It is a random coil α helical structure

38. The official definition provided by IUPAC stating "an ensemble of stearic and electronic features that is necessary to ensure the optimal supramolecular interactions with a specific biological target and to trigger (or Block) its biological response", is describing which of the following?

    A) Pharmacophore   B) Drug   C) Ligand   D) Target

39. During gene transcription formation of polyribosome is an important way to achieve which of the following.

    E) To synthesize multiple proteins in short duration
    F) To make single protein in a fastest manner
    G) To prevent clogging of cells with ribosomes
    H) To edit the protein so that right type proteins is formed

40. Identify the correct set of codons.

    A) UAA is initiation codon and AUG,UAG ,UGA are termination codons
    B) UAG is initiation codon and UAA,UGA, AUG are termination codons
    C) AUG is initiation codon and UAA,UAG ,UGA are termination codons
    D) UGA is initiation codon and UAA,UAG , AUG are termination codons

41. During recombinant DNA Technology, generally, all of the following enzymes can be used for modifying DNA molecules by addition or removal of specific chemical groups, except.

A) Alkaline phosphatase
B) Acid phosphatase
C) Polynucleotide kinase
D) Terminal deoxynucleotidyltransferase

42. Identify the correct order of basic steps in Polymerase Chain Reaction

A) Denaturation, Annealing and Synthesis
B) Denaturation, Synthesis and Annealing
C) Annealing, Denaturation, and Synthesis
D) Annealing, Synthesis and Denaturation

43. Chitin is the principle structural component of exoskeleton of invertebrates, it is a homopolymer of.

A) N-acetyl –D glucosamine in β (1 → 4) linkage
B) N-acetyl –D glucosamine in α (1 → 4) linkage
C) N-acetyl –D galactosamine in β (1 → 4) linkage
D) N-acetyl –D galactosamine in α (1 → 4) linkage

44. Indicate the ionic species of ammonia that predominates at pH4, and pH 11.

A) NH_3 and NH_4^+ respectively   B) NH_4^+ and NH_3 respectively
C) NH_4^+ at both the pH   D) NH_3 at both the pH

45. Describe the outcome of a chain terminator DNA sequencing reaction when too much of ddNTP was added

A) The fragments generated would be terminated at initiation only
B) The fragments generated would not be terminated hence very long fragments
C) The fragments generated be terminated more frequently hence no longer fragments
D) The fragments generated would not be terminated more frequently hence longer fragments

46. Minimum size requirement for a foreign gene cloning using YAC as a vector is:

B) < 25 kbp   B) >25 - < 40 kbp
C) ⩾100 kbp   D) >10- <25 kpb

47. The point of contact of terminus of an axon with muscle fiber is represented as

A) Nerural synapse   B) Neuro-muscular junction
C) Neuro-hinge   D) Neuro- skeletal synapse

48. All of the following bioinformatics approaches can be used for structure prediction by comparative modeling and quality assessment, except

A) PredictProtein   B) SWISS-MODEL
C) MODELLER   D) MEGA

49. One of the major components that prevents freezing blood in the arctic bear is

    A) Blood has very low blood cells
    B) Antifreeze protein
    C) Blood has very high blood cells
    D) High salinity of the blood

50. G-protein coupled receptors are called serpentine receptors due to one of the following reason

    A) There conformations appears as snake
    B) These have seven molecules attached to it for signaling
    C) These were isolated from rattle snak
    D) Seven signaling ligand bind directly to these receptors

x-x-x

1. Which of the following two currents flowing almost side by side in the philosophy of Vivekananda?
   A) Nyaya and Samkhya   B) Adviat Vedanta and Bhakti-cult
   C) Mimamsa and Advait Vedanta   D) Jainism and Buddhism

2. What is the view of Vivekananda about the two currents (Advaita and Bhaki-cult) flowing side by side in his philosophy?
   A) These are two different systems of philosophy
   B) These are the same ways targeting towards different goals
   C) These are two ways of looking at the reality
   D) None of the above

3. Vivekananda is a ___, and yet God, according to him, is personal____
   A) Monist   B) Polytheist   C) Pantheist   D) Henotheist

4. According to Vivekananda, the absolute can be described as____
   A) Sat-cit-ananda   B) Nirguna
   C) Anirvacaniya   D) None of these

5. Vivekananda asserts that ananda is in___
   A) Sacrifice   B) Surrender   C) Love   D) Service

6. The one watch-word for universal religion, according to Vivekananda, is___
   A) Self-service   B) Compromise
   C) Acceptance   D) Perfect-liberation

7. The believer in the universal religion has to be broad minded and open hearted, he would be prepared to learn from-

   A) The scriptures of all religions   B) Vedas
   C) Bhagvadgita   D) Manusmrti

8. Which among the following expresses the Vivekandanda's conception about religion?
   A) It is growth from within
   B) It is inherent in the very constitution of man
   C) Its nature can be known by analysing the religious sense
   D) All of the above

9. What, according to Vivekananda, is the nature of supernatural element?
   A) God, or an impersonal principle
   B) The absolute reality, or the destiny
   C) The law, or anything of this sort
   D) All of the above

10. Universal religion has to be acceptable to
    A) All minds   B) Only its' members
    C) Hindus only   D) Indians only

11. The delight of world-process in relation to the satcitananda is called_____

    A) Maya   B) Adhyasa   C) Lila   D) Prakrti

12. Swami Vivekananda's family name was…

    A) Narendra Nath Datta   B) Surendra Nath Datta

    C) Virender Nath Datta   D) Jatinder Nath Datta

13. Name of Swami Vivekananda's mother is

    A) Bhuvaneswari Devi   B) Gyaneshwari Devi

    C) Dayawati   D) Kalwati

14. When was Swami Vivekananda born?

    A) 1863   B) 1862   C) 1865   D) 1867

15. In which college Narendranath first studied?

    A) Presidency College, Calcutta   B) Oxford Collage

    C) Cambridge college   D) Govt College Calcutta

16. Who was responsible for meeting of Swami Vivekananda with Ramakrishna Paramahamsa ?

    A) Jonson Steve   B) Willson

    C) John Hasie   D) Principal William Hastie

17. Who requested Narendra Nath to assume the name of Vivekanada?

    A) Maharaja of Khetri   B) Maharaja of Junagarh

    C) Maharaja of Patiala   D) Maharaja of Unnao

18. Swami Vivekanada earned wild applause for beginning his address at the World Parliament of Religions with the famous words…………

    A) "Sisters and Brothers of America"

    B) "Distinguished delegates of America"

    C) "Bhaiyo aur Beheno"

    D) "Dear friends of America"

19. Narendranath met for the first time Shri Ramakrishna Paramahamsa at whose house?

    A) Rajendernath   B) Surendranath Mitra of Simulia

    C) Vishwanath   D) Dharmendranath Mitra

20. In which year Narnedranath met Shri Ramakrishna for the first time?

    A) 1881   B) 1892   C) 1893   D) 1891

21. Who founded famous KALI temple at Dakshineshwar

    A) Rani Ranjini   B) Rani Rukmini   C) Rani Phulmati   D) Rani Rasmani

22. As wandering monk Narendranath kept two books in his bundle ,wchich are these two books?

    A) Gita and the Imitation of Christ   B) Ramayana and Gita

    C) Ramayana and Bible   D) Gita and Koran

23. How many days Swami Vivekananda Meditated on the rock of Kanyakumari?
    A) Seven days   B) Three days   C) Five days   D) Two days

24. In anticipation of his visit to America ,Swami Vivekananda approached the leader of which society
    A) Brahmo Samaj   B) Arya Samaj
    C) Theosophical society   D) Red Cross Society

25. Who gave financial and other Assistance to Swami Vivekananda for his Visit to America?
    A) Rani Rasmani   B) Raja of Baroda
    C) Raja of Khetri   D) Raja of Jammu

26. In which year Swami Vivekananda established Vedanta Society in New York?
    A) 1894   B) 1982   C) 1893   D) 1891

27. Swami Vivekananda helped Mr:E.T.Sturdy to study Sanskrit and to translate one famous Sutra in to English and write a commentary on them .What was that famous Sutra?
    A) Shiva sutra   B) Narada-Bhakti Sutra
    C) Yog Sutra   D) Shaunik Sutra

28. India observing birth Day of Swami Vivekananda as ?
    A) Vijay Diwas   B) National Water Day
    C) National Youth Day   D) National Strength Day

29. Swami Vivekananda was the chief disciple of whom?
    A) Ramakrishna Paramahsan   B) Ramanuja
    C) Raman Maharishi   D) Dayananda Saraswati

30. Vivenkananda was the founder…………………………mission?
    A) Theosophical Society   B) Brahmo Samaj
    C) Arya Samaj   D) Ramakrishna Mission

31. Who was the Guru of Swami Vivekananda?
    A) Shri Ram Krishna Parmahansa   B) Shri Ram tirtha
    C) Swami Gurudas   D) None of these

32. The Upanishad which mentions all the four Ashramas for the first time, is
    A) Isha   B) Chhandogya
    C) Jabalopanishad   D) Brihadaranayaka

33. Which of the following are the characteristics of the Advaita Philosophy of Shankara?
    A) Brahman an ultimate reality
    B) All mistakes are due to ignorance
    C) Two levels of realities – conventional reality and absolute reality.
    D) All the above

34. Which philosophy says "Do not care to know various theories about God and Soul; do good and be good; that will take you to whatever truth there is" ?
   A) Sankhya   B) Buddhism   C) Vedanta   D) Jainism

35. The two basic divisions in Schools of Indian Philosophy are
   A) Vedanta and Buddhism   B) Advaita and Dwaita
   C) Theistic and Atheistic   D) Orthodox and Heterodox

36. Which of the following Orthodox (Astik) Schools of Indian Philosophy, is silent on the issue of existence of God as the ultimate reality?
   A) Vedanta   B) Sankhya   C) Poorva Mimansa   D) Nyaya

37. A common feature of Hinduism, Buddhism and Jainism is belief about
   A) The unreality of the world   B) The existence of God
   C) The soul   D) Karma and rebirth

38. In Indian Philosophy 'pramana' means
   A) Oath   B) Measurement
   C) Assurance   D) Source of knowledge

39. Creation, according to Sri Aurobindo, is nothing but an_____
   A) Expression of sorrow   B) Expression of nothingness
   C) Expression of Joy   D) None of these

40. According to Sir Aurobindo, evolution is possible only because _____has already taken place_____
   A) Destruction   B) God   C) Involution   D) None

41. Which of the following constitute a religious life according to Tagore?
   A) Love   B) Sacrifice   C) Sincerity   D) Innocence

42. What is the innermost truth of man according to Tagore?
   A) Animity   B) Manhood   C) Preisthood   D) All of these

43. Tagore wanted to train humanbeing for_____
   A) Freedom   B) Peace   C) Justice   D) All of these

44. Who was the saint of Arunachala?
   A) Ramana Maharishi   B) Aurobindo
   C) Ravindernath Tagore   D) Ram Tirath

45. Ramana Maharishi attained self realization at
   A) Shiva temple   B) Kali temple
   C) Meenaskhi temple   D) Ganesh temple

46. To realize our nature we have to perform all our mandane duties as the service to God stated by

A) Anandamayi Ma   B) Sharda Ma
C) Sister Navedita   D) Vivekananda

47. The concept of super mind was introduced by
A) Mahatma Gandhi   B) Ravindernath Tagore
C) Aurobindo   D) Swami Ram Tirath

48. The name of Swami Ram Tirath's Book is_____
A) Forest of God realisation   B) Impact of God realisation
C) Woods of God realisation   D) Idea of God realisation

49. Chanting of Om was recommended by
A) Mahatama Gandhi   B) Ramkrishna Parmahansa
C) Swami Ram Tirtha   D) Aurobindo

50. According to Aurobindo, the realm of reality has been devided into two hemispheres, _____and _____

A) Higher, lower   B) North, south
C) Upper, lower   D) None of these

x-x-x

Women's Studies(Ph.D.)   (1077)

1. The term 'womanist' was coined by:
    A) Alice Walker   B) Bell hooks
    C) Patricia Hill Collins   D) Simone de Beauvoir

2. Which one of the following is not included in the list of Gender Critical Districts as per the Census of India 2011:
    A) Chandigarh   B) Panchkula   C) Fatehgarh Sahib   D) Tarn Taran

3. Which of the following States are providing for 50 per cent reservation for women in urban and rural local bodies:
    A) Tamil Nadu   B) Bihar   C) Nagaland   D) Punjab

4. Which Article of CEDAW provides that temporary special measures accelerating de facto equality between men and women, such as affirmative action measures, will not be considered discriminatory?
    A) Article 1   B) Article 2   C) Article 3   D) Article 4

5. Which section of IPC deals with voluntarily causing grievous hurt by use of acid, etc?
    A) Section 326   B) Section 498   C) Section 556   D) Section 420

6. Who is the author of the book ' Man made language'
    A) Shulamith Firestone   B) Dale Spender
    C) Julia Kristeva   D) Juliet Mitchell

7. The gobal gender gap index examines four overall areas of inequality between men and women. Which one of the following is not a variable used in this measurement?
    A) Economic participation and opportunity   B) Educational attainment

    C) Political empowerment   D) Violence against women

8. The major objective of the POCSO Act is to:
    A) Protect children from sexual offences
    B) Protect the general public including men and women from sexual offences
    C) Prevent sexual harassment at the workplace
    D) Protect children from all forms of abuse

9. The _____approach calls for greater attention to women in development policy and practice:
    A) Women in Development   B) Feminist environmentalism
    C) Sustainable human development   D) Basic needs theory

10. Which one of the following is not a form of qualitative research:
    A) Case study   B) Oral history
    C) Survey   D) Focus group discussion

11. Which one of the following has been a chairperson of NCW?
    A) Pam Rajput   B) Amriti Irani
    C) Poornima Advani   D) Veena Mazumdar

12. Queer theory relates to:
   A) Sexual identities
   B) Prohibition of homosexuality
   C) Regarding lesbians as outcasts
   D) Promotion of heterosexuality

13. Which one of the following feminist theories propounded the idea of female rationality?
   A) Radical feminism
   B) Socialist feminism
   C) Marxist feminism
   D) Liberal feminism

14. Match the following:

List I	List II
a. Chandra Kochar	i. Bicon India Ltd
b. Indra Nooyi	ii. ICICI Bank
c. Ekta Kapoor	iii. Pepsico
d. Kiran Mazumdar Shaw	iv. T.V. Serials

   A) a-ii, b-iii, c-iv, d-I
   B) a-i, b-ii, c-iii, d-iv
   C) a-iii, b-iv, c-i, d-ii
   D) a-iv, b-i, c-ii, d-iii

15. Match the Following books with their authors:

A) Charlotte Perkins Gillman	1.	Herland
B) Kate Millett	2.	Sexual Politics
C) Margaret Atwood	3.	The Handmaid's Tale
D) Judith Butler	4.	Gender Trouble

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

16. Which of the following books is written by Virginia Woolf:
   A) A Room of One's Own
   B) Fear of Flying
   C) The Beauty Myth
   D) Herland

17. Chandra Talpade Mohanty is regarded as a
   A) Liberal feminist
   B) Psychoanalytical feminist
   C) Postcolonial feminist
   D) Cultural feminist

18. Which one of the following is associated with the Seneca Falls Convention?
   A) Lucretia Mott
   B) Mary Wollstonecraft
   C) Olympe de Gouges
   D) Marquis de Condorcet

19. The slogan "The Personal is Political" was coined by
   A) Carol Hanisch
   B) Nancy Hartsock
   C) Jean Bethke Elshtain
   D) Hillary Clinton

20. Which of the following women scientists have won the Noble Prize in their respective fields:
   i) Marie Curie
   ii) Irene Joliot Curie
   iii) Gerty Theresa Cori
   iv) Maria Goeppert-Mayer

   A) i & ii
   B) i, ii & iii
   C) i, ii, iii & iv
   D) i, ii & iv

21. Which one of the following authors argues that rape is "a conscious process of intimidation by which all men keep all women in a state of fear."
   A) Susan Brownmiller   B) Judith Butler
   C) Iris Young   D) Sylvia Walby

22. Positivism is:
   A) Having a positive attitude towards the respondents during research
   B) An epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond
   C) An epistemological position that advocates that social reality can only be studied through a positive scientific approach
   D) The belief that the research findings would be incorporated into a policy framework

23. Using multiple and diverse methods to study a single problem is known as:
   A) Triangulation   B) Methodological rigour
   C) Scientific method   D) Empirical research

24. Which one of the following is a type of probability sampling?
   A) Convenience sampling   B) Simple random sampling
   C) Snowball sampling   D) Quota sampling

25. Grameen Bank was founded by:
   A) Mohd Younus Khan   B) Ela Bhatt
   C) Veena Mazumdar   D) Armaity Desai

26. Which one of the following is written by Tarabai Shinde:
   A) Padmarag   B) Motichoor
   C) Sultana's Dream   D) Stri-Purush Tulana

27. The writer of 'Silent Springs', a book credited with advancing the global environment movement was:
   A) Vandana Shiva   B) Maria Mies
   C) Rachel Carson   D) Bina Aggarwal

28. The International Women's Day theme for 2017 was:
   A) Pledge for Parity   B) He for She
   C) Be Bold for Change   D) Coming together

29. The feminist concept of sisterhood is based on the belief that:
   A) The social and biological reality of being female gives all women a fund of common experience.
   B) Women should act like sisters
   C) Women in a given area would necessarily be related to each other.
   D) There is no such concept

30. Which one of the following writers uses the existentialist principle to analyse gender:
   A) Shulamith Firestone   B) Mary Wollstonecraft
   C) Simone de Beauvoir   D) Juliet Mitchell

31. Research methods producing descriptive data such as people's written or spoken words are known as:

    A) Qualitative methods   B) Quantitative methods

    C) Survey methods   D) Experimental methods

32. Which one of the following believed that women cannot be regarded as citizens because they are not rational:

    A) Elizabeth Cady Stanton   B) Aristotle

    C) Mary Wollstonecraft   D) J.S. Mill

33. Which one of the following asked her husband not to "forget the ladies":

    A) Abigail Adams   B) Sojourner Truth

    C) Olympe de Gouges   D) Lucretia Mott

34. Rank the following States in order of female literacy rate according to 2011 census from highest to lowest:

    i)   Kerala

    ii)   Chandigarh

    iii)   Mizoram

    iv)   Pondicherry

    A) Kerala, Pondicherry, Chandigarh, Mizoram

    B) Kerala, Chandigarh Pondicherry, , Mizoram

    C) Kerala, Mizoram, Chandigarh, Pondicherry

    D) Kerala, Pondicherry, Mizoram, Chandigarh

35. Sylvia Walby has identified six structures of patriarchy. Which one of the following is not one of these?

    A) Paid employment   B) Household production relations

    C) State   D) Political parties

36. Which one of the following is not correct:

    A) Kate Millett   Sexual Politics

    B) Ann Oakley   The Reproduction of Motherhood

    C) Mary Daly   Gyn/Ecology

    D) Dorothy Dinnerstein   Of the mermaid and the Minotaur.

37. The type of sexual harassment known as "quid pro quo" refers to

    A) Someone paying for sex from a prostitute

    B) Sexual activity taking place at the work site

    C) A situation where a superior requires sexual favors for a job advancement

    D) Any sexual harassment

38. An inductive theory is one that :

    A) Involves testing an explicitly defined hypothesis.

    B) Does not allow for findings to feed back into the stock of knowledge

    C) Uses quantitative methods whenever possible

    D) Allows theory to emerge out of the data

39. Which of the following are the duties of a Protection Officer appointed under the Protection of Women from Domestic violence Act:
A) to make available a safe shelter home, if the aggrieved person so requires
B) To act as a body guard for the victim
C) To inform the offender that his behavior is intolerable and would not be accepted
D) All of the above

40. The feminist vision of transformative politics implies:
A) Transformed processes   B) Transformed institutions
C) Equality   D) All of these

41. Which one of the following defined power as the " ability of A to make B do something which he would not otherwise do":
A) John Locke   B) Karl Marx
C) Robert Dahl   D) Frederick Engles

42. Which one of the following delivered a speech in which she repeatedly posed the question, "Ain't I a woman?"
A) Mary Wollstonecraft   B) Sojourner Truth
C) Bell hooks   D) Patricia Hill Collins

43. The issue of women's reproductive rights gained attention in:
A) Universal Declaration of Human Rights
B) International Convention on Civil and Political Rights
C) International Convention on Economic, Social and Cultural Rights
D) International Conference on Population and development

44. Maternal Mortality Ratio is :
A) number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births.
B) Number of mothers who die in a given time period due to any cause related to their reproductive health
C) Number of women who die of any disease while pregnant or after birth of the child
D) All of the above

45. Which of the following statements is/are true:
i)   Women are more vulnerable to HIV/AIDS because of increased pre-marital and extra-marital sex
ii)   There is feminization of the AIDS epidemic
iii)   Women are more vulnerable to HIV/AIDS because of gender roles
iv)   Women are less vulnerable to HIV/AIDS as compared to men

A) All statements are true
B) Only i, ii and iii are true
C) Only ii and iii are true
D) Only iii and iv are true

46. Feminists are critical of human rights framework as they believe that:
    A) Women's experiences are not taken into account
    B) The rights are not applicable to women
    C) Only some of the rights are relevant for women
    D) None of the above. Feminists are happy with human rights framework

47. Which one of the following was a proponent of natural rights:
    A) Bentham   B) John Locke
    C) J.S. Mill   D) Mary Wollstonecraft

48. Androcentricism refers to:
    A) Perspectives concerned with centrality of male
    B) Perspectives concerned with centrality of female
    C) Neither male nor female
    D) None of the above

49. A metaphor for the way in which women disappear from some careers along the way is:
    A) Glass ceiling   B) Sticky floors
    C) Missed opportunities   D) Leaky pipeline

50. The term 'chilly climate' in relation to women's work refers to:
    A) A hostile work environment
    B) Cold weather conditions hamper women's work
    C) Gender roles impacting work
    D) Discrimination in workplace

x-x-x

Zoology

1. The respiratory organs in spiders are
    A) Book lungs
    B) Book gills
    C) Tracheae
    D) Book lungs and tracheae

2. In a sponge, the incoming current of water enters through ostia into spongocoel and leaves to the outside through osculum. This kind of canal system is
    A) Asconoid
    B) Syconoid
    C) Leukonoid
    D) Eurypylous

3. What function is served by flame cells?
    A) Storage
    B) Defense
    C) Excretion
    D) Secretion of digestive enzymes

4. The number of neck vertebrae in giraffe is
    A) Same as in man
    B) More than that in man
    C) More than that in any other mammal
    D) Less than that in man

5. Which of the following is concerned with ear?
    A) Fossa ovalis
    B) Foramen ovale
    C) Fenestra ovalis
    D) Fovea lutea

6. Which part of the brain is concerned with logic, science and mathematics?
    A) Left side
    B) Right side
    C) Middle
    D) Medulla oblongata

7. The molar teeth in man are
    A) Bunodont
    B) Secodont
    C) Selenodont
    D) Lophodont

8. A temporary endocrine gland in human body is
    A) Corpus callosum
    B) Corpus luteum
    C) Corpus allatum
    D) Corpus cardiacum

9. Which of the following is found in sputum samples?
   A) *Paragonimus westermani*
   B) *Enterobius vermicularis*
   C) *Ascaris lumbricoides*
   D) *Ancylostoma duodenale*

10. Which of the following nematode is ovoviviparous?
   A) *Ascaris lumbricoides*
   B) *Dracunculus medicinensis*
   C) *Strongyloides stercoralis*
   D) *Trichinella spiralis*

11. Intermediate host for *Sarcosystis hominis* is
   A) Man
   B) Cattle
   C) Pig
   D) Cat

12. Calabar swelling is seen in infection with
   A) *Onchocerca volvulus*
   B) *Loa loa*
   C) *Brugia malayi*
   D) *Wuchereria bancrofti*

13. Which of the following act as a main reservoir of *Balantidium coli* infection in human beings?
   A) Man
   B) Monkey
   C) Cow
   D) Pig

14. Dog heart tapeworm is the common name for
   A) *Toxocara canis*
   B) *Dirofilaria immitis*
   C) *Mansonella streptocerca*
   D) *Toxoplasma gondi*

15. In Isoelectric focusing, proteins are separated
   A) In a pH gradient
   B) In a salt Gradient
   C) In a density gradient
   D) In a temperature gradient

16. Positron emission tomography, a medical imaging technique is based on
   A) Alpha decay
   B) Beta decay
   C) Electron emission
   D) X-rays emission

17. If 33µg/ml of oligonucleotide solution has an absorbance of 1 at 260 nm, what

will be the concentration of oligonucleotide solution, if its absorbance at 260 nm is 0.12?
- A) 3.96 µg/ml
- B) 1029.6 µg/ml
- C) 39.60 µg/ml
- D) 10.29 µg/ml

18. Confocal microscopy is based on which microscopic technique?
- A) Electron microscopy
- B) Dark field microscopy
- C) Phase contrast microscopy
- D) Fluorescence microscopy

19. Karnovsky's fixative is
- A) Acrolein
- B) Paraformaldehyde
- C) Glutaraldehyde and Paraformaldehyde
- D) Glutaraldehyde and Osmium Tetraoxide

20. Complement receptors on red blood cells and Fc receptors on platelets probably facilitate
- A) Phagocytosis of immune complexes by red blood cells and platelets
- B) Pinocytosis of immune complexes by red blood cells and platelets
- C) The synthesis of gamma interferon by the platelet
- D) The elimination of immune complexes by phagocytic cells

21. Dendritic cells are characterized by
- A) Expression of CD3
- B) Expression of IgM molecules
- C) Their ability to release histamine
- D) Their interface between the innate and acquired immune systems

22. The meiotic process by which homologues are paired during prophase 1 is called
- A) Chiasma
- B) Interkinesis
- C) Crossing over
- D) Synapsis

23. When a cell stops growing due to shortage of nutrients, this will occur in which phase of cell cycle?
- A) G1
- B) G2
- C) S
- D) M

24. At biallelic locus two alleles 'A' and 'a' occur in a population with frequency of 'p' and 'q' respectively. If value of p is 0.85, what will be expected genotypic frequency of individuals with 'Aa' genotype in that population?

A) 0.72
B) 0.13
C) 0.25
D) 0.02

25. Molecular biology technique in which a mutation is created artificially at a defined site in a DNA molecule is known as
    A) Site specific restriction digestion
    B) Site directed Mutagenesis
    C) Site directed transposition
    D) Site specific molecular cloning

26. Which protein plays important role in making ectoderm competent to the inductive signals from optical vesicle?
    A) Wnt
    B) Nodal Proetins
    C) Pax 6
    D) Hoxa

27. The chemical substance that is emitted by an organizer is
    A) Inductor
    B) Evacuator
    C) Hormone
    D) Morphogenetic determinant

28. Oxygen binding capacity of frog tadpole is
    A) Independent of pH
    B) Dependent on pH
    C) Very slow
    D) Inversely proportional to pH

29. If a salamander's leg is severely injured and cannot function, a new leg is formed while the injured leg is still dragged by the animal. This is a case of
    A) Morpholaxis
    B) Super regeneration
    C) Heteromorphosis
    D) Autotomy

30. The inward migration of cells during gastrulation to form archenteron is
    A) Epiboly
    B) Emboly
    C) Endomixis
    D) Epiauxesis

31. What is true about endocrine disruption?

    1. Compounds causing endocrine disruption originate from a very narrow class of chemical compounds.
    2. Compounds causing endocrine disruptors are present in our food and

environment.

3. Compounds causing endocrine disruption are toxic to one of the hormone producing organs.
4. Compounds causing endocrine disruption can be a risk factor for cancer incidences.
5. Compounds causing endocrine disruption may cause developmental toxicity.

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

32. Which of the following is not a tumor suppressor gene?
A) Retinoblastoma
B) Tumor protein p53
C) BCR-ABL fusion gene
D) PTEN

33. Which molecules are involved in the anchoring of cells to an extracellular matrix?
A) Integrins
B) Interleukins
C) Angiostatin
D) Cyclins

34. During urine formation in normal healthy human kidneys, the fluid leaving loop of Henle and entering distal convoluted tubule is
A) Hypo-osmotic to plasma
B) Hyper-osmotic to plasma
C) Iso-osmotic to plasma
D) Can be hypo-osmotic or hyper-osmotic to plasma

35. Blood-testis barrier is formed by which of the following cells?
A) Sertoli cells
B) Leydig cells
C) Germinal epithelial cells
D) Spermatogonia

36. During the _____ phase of menstruation, the lining of the uterus rebuilds.
A) Menstrual
B) Proliferative
C) Secretory
D) The lining of the uterus rebuilds continually

37. Maximum bicarbonate formation from CO_2 during the transport of CO_2 in the blood takes place inside the
A) Blood Plasma
B) WBCs
C) RBCs
D) Serum

38. The volume of blood that remains in each ventricle at the end of ventricular systole is called
    A) Stroke's volume
    B) Ejection fraction
    C) End-diastolic volume
    D) End-systolic volume

39. Which of the following are manifestations of Magnesium deficiency?
    A) Low haemoglobin
    B) Muscular weakness
    C) Alopecia
    D) Cracks on the side of lips

40. Which of the following is not a high energy compound?
    A) ATP
    B) Cyclic AMP
    C) Phosphoenol pyruvate
    D) Glucose 6-phosphate

41. Which of the following shuttle systems is preferably used in the heart for the transport of reducing equivalents?
    A) Malate-Aspartate shuttle
    B) Glycerol-phosphate shuttle
    C) Electron transport chain
    D) Oligomycoin

42. The end product of glycolysis in erythrocytes is
    A) Pyruvate
    B) Phosphoenolpyruvate
    C) Lactate
    D) Glucose -6-phosphate

43. HMP pathway is unique in the generation of which of the following?
    A) NADPH and heptoses
    B) NADPH and pentoses
    C) NADH and heptoses
    D) NADH and pentoses

44. Who is considered as the father of Epidemiology?
    A) Aristotle
    B) Alexander Fleming
    C) John Snow
    D) Socrates

45. The type of parthenogenesis where only males are produced is
    A) Arrhenotoky
    B) Thelytoky
    C) Amphitoky
    D) Apomixis

46. Blue baby syndrome is caused by prolonged intake of water with excess of
    A) Fluorides

B) Lead
C) Nitrates
D) Calcium and Magnesium salts

47.   Labyrithiform organs are present in
        A) *Clarias batrachus*
        B) *Anabas testudineus*
        C) *Periophthalmus*
        D) *Lepidocephalichthys*

48.   Which of the following is a free living nitrogen fixing bacterium?
        A) *Nitrosomas*
        B) *Rhizobium*
        C) *Clostridium*
        D) *Nitrobacter*

49.   Which of the following is a saw shark?
        A) *Sphyrna*
        B) *Pristophorus*
        C) *Pristis*
        D) *Dasyatis*

50.   Snakeheads are characterized by
        A) Scales behind operculum
        B) No scales on body
        C) Scales on head
        D) Snake like body

x-x-x

Food Technology

1. Which of the following factor(s) affect the growth of microorganisms?

   A) Water activity

   B) pH

   C) O-R Potential

   D) All of these

2. The enzymatic reaction rate is reduced to half by decreasing temperature by

   A) $10^{o}C$

   B) $20^{o}C$

   C) $50^{o}C$

   D) $0^{o}C$

3. Hedonic test pertains to:

   A) Sensory evaluation

   B) Total solids evaluation

   C) Total soluble solids evaluation

   D) Total deformation evaluation

4. Which of the following enzymes is responsible for off-flavor development in cream & butter

   A) Lipase

   B) Protease

   C) Peroxidase

   D) None of these

5. Which of the following is a milk sugar

   A) Lactose

   B) Fructose

   C) Glocose

   D) None of these

6. Which of the following nutrient if not used is converted into fat in the body

   A) Fat

   B) Carbohydrate

   C) Protein

   D) Vitamins

7. Bread dough is ------------ in nature.

   A) Viscous

   B) Elastic

   C) Visco-elastic

   D) Solid

8. The most heat resistant microorganism is

   A) Clostridium botulinum

   B) Str. cremoris

   C) Saccharomyces cerevase

   D) Lactobacillus bulgaricus

9. Salt is a better preservative than sugar, because it

   A) Has lower molecular weight

   B) Lowers the vapor pressure of food water by a large extent

C) Kills microorganisms better   D) Reduces pH

10. The food fiber that produces necessary dietary roughage is largely

A) Cellulose   B) Hemicelluloses

C) Dextrin   D) Pectin

11. Pectin and gums are added to food as

A) Thickeners and stabilizers   B) Emulsifier

C) Humactant   D) Colorant

12. The manometer is used to measure:
A) Fluid velocity   B) Fluid density

C) Fluid pressure   D) Fluid viscosity

13. Lecithins are structurally like fats but contain

A) Oxalic acid   B) Citric acid

C) Phosphoric acid   D) Capric acid

14. Which of the following metals are strong promoters of oxidation

A) Na and Fe   B) Na and Al

C) Al and Cu   D) Cu and Fe

15. Which one is not a thermal processing equipment?
A) Blancher   B) Pasteurizer

C) Centrifuge   D) Evaporator

16. Carotene gives

A) Orange color   B) Red color

C) Green color   D) Purple color

17. Fat soluble vitamins are

A) A, D, E, & K   B) A, D, C, & K

C) A, C, E, & K   D) A, B, E, & K

18. Water which can not be removed by drying is called

A) Bound water   B) Free water

C) Unbound water   D) Frozen water

19. Which is the body's primary source of energy?

A)	Fructose	B)	Sucrose
C)	Glycogen	D)	Glucose

20. Anabolic process of converting extra glucose into glycogen is called

A)	Catharisis	B)	Metabolism
C)	Anabolism	D)	Glycogenesis

21. An enzyme which acts only in acidic medium is

A)	Pepsin	B)	Trypsin
C)	Rennin	D)	Amylase

22. The Reynolds number for turbulent fluid flow in a pipe is:
A)	Less than 2100	B)	Greater than 2100
C)	Greater than 4000	D)	Greater than 10,000

23. Which of the following is most concentrated source of energy

A)	Fats	B)	Proteins
C)	Carbohydrates	D)	All of these

24. Lactic acid is formed in milk on fermentation of

A)	Lactose	B)	Sucrose
C)	Fructose	D)	None of these

25. What causes potato slice to turn brown

A)	Carmelization	B)	Staling
C)	Protein degradation	D)	Enzymatic activity

26. Which of the following is non-thermal method of processing

A)	UHT	B)	Microwave
C)	Membrane processing	D)	None of these

27. A counter-current heat exchanger carrying the same flow rate of the same liquid as hot- and cold- streams has an NTU of 3. The effectiveness of heat exchanger is

A)	0.5	B)	0.6
C)	1.0	D)	0.75

28. It is found that the energy required to reduce particles from mean diameter of 10 mm to 3 mm is 11 kJ/kg. The energy required to reduce the same material from 1 mm to 0.3 mm,

according to Rittinger's law, is

A) 10 kJ/kg	B) 11 kJ/kg
C) 100 kJ/kg	D) 110 kJ/kg

29. A milk can be sterilized either at 135°C for 6 s or 140°C for 2 s. The z-value of the microorganism to destroy in the process is

A) 11.45°C	B) 13.25 °C
C) 9.86 °C	D) 10.48 °C

30. At an atmospheric pressure 101.325 kPa and 30 °C ambient temperature, the vapor pressure of water is 4.242 kPa. If the partial pressure of water vapor in the atmosphere is 2.52 kPa, then the %RH would be

A) 41.8	B) 59.4
C) 68.6	D) 74.2

31. When vaporization takes place directly at the heating surface, it is called

A) Film boiling	B) Nucleate boiling
C) Vapor binding	D) Forced boiling

32. With increase in porosity, thermal conductivity of a solid material

A) Increases	B) Decreases
C) Remains unchanged	D) None of these

33. The water activity of the dried food product is approximately

A) 0.65	B) 0.85
C) 1.0	D) 0.0

34. The pioneer of canning is

A) Charles Appert	B) Nicolas Appert
C) Louis Pasteur	D) Mike Lewis

35. Dietus-Boelter equation used for determination of heat-transfer coefficient is valid for

A) Laminar flow	B) Turbulent flow
C) Plug flow	D) Transition flow

36. A culture contains 104 cells/mL initially and 108 cells/mL after 4 h. The growth rate

constant will be

A) 1.203 h^{-1} B) 0.303 h^{-1}

C) 2.303 h^{-1} D) 3.303 h^{-1}

37. What is the generation time of a bacterial population that increases from 10,000 cells to 10,000,000 cells in 4 h?

A) 24 min   B) 20 min

C) 14 min   D) 26 min

38. The dimensionless number representing the ratio of drag force to inertial force is

A) Power number   B) Reynolds number

C) Lewis number   D) Nusselt number

39. The law which describes the molecular diffusion is known as

A) Fourier's law   B) Fick's law

C) Kick's law   D) Newton's law

40. Unit of thermal diffusivity is

A) m/s   B) m^2/s

C) Dimensionless   D) ^{o}C/s

41. The SI unit of thermal flux is

A) J/s.m^2 B) J/s

C) J/m^2 D) J/s.C.m^2

42. The LMTD (^{o}C) for counter-current flow in a heat exchanger where one stream rises from 20 to 70°C while other decreases from 95 to 80°C is

A) 40   B) 45

C) 50   D) 60

43. The ratio of molecular diffusivity of momentum to molecular diffusivity of mass is designated as

A) Schmidt number   B) Sherwood number

C) Prandtl number   D) Reynolds number

44. The process of cooking moistened starchy and protenous food by a combination of heat, pressure, and shear is called

A) Thermal cooking   B) Mechanical expression

C) Extrusion cooking   D) High pressure cooking

45. Temperature distribution across a slab during conduction heat transfer is

A) Exponential   B) Nonlinear

C) Sigmoid   D) Linear

46. The wet basis moisture content for a material is 20%. Then, the dry basis moisture content will be

A) 25%   B) 24%

C) 20%   D) 40%

47. Ratio of the mean free path to the flow diameter is called

A) Knudsen number   B) Lewis number

C) Nusselt number   D) Reynolds number

48. Amount of moisture removed from 800 kg grain when drying from 28% to 12% moisture content (wet basis) is

A) 145.45 kg   B) 142.25 kg

C) 154.2 kg   D) 80 kg

49. Major forces acting in a cyclone separator are

A) Gravity and centrifugal   B) Gravity and centripetal

C) Centripetal and centrifugal   D) Centrifugal

50. Water activity for bound water is

A) <1   B) =1

C) >1   D) 100

x-x-x