Question Booklet Series: **A** *Question Booklet Serial No.* 100445

PULEET – 2018

Important: *Please consult your Admit Card/Roll No. slip before filling your Roll Number on the Test Booklet and Answer Sheet.*

Roll No. ***In Figure*** ***In Words***

O.M.R. Answer Sheet Serial No.

Signature of Candidate: _____ *Signature of Invigilator:* _____

Time: 90 Minutes **Number of Questions: 75** **Maximum Marks: 75**

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO.

INSTRUCTIONS:

1. Write your Roll No. on the Questions Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Question Booklet Serial No. on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point/Black Gel Pen**.
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. Please check that this Question Booklet contains 75 Questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of Test.
5. Each question has four alternative answer (A,B,C,D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point/Black Gel Pen. There shall be negative marking for wrong answer, ¼ of the marks of the question will be deducted for every wrong answer.**
6. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Booklet. No marks will be deducted in such cases.
7. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the question given in the Question Booklet.
8. If you want to change an already marked answer, erase the shade in the darkened bubble completely.
9. For rough work only the blank sheet at the end of the Question Booklet be used.
10. The University will provide logarithmic tables. Borrowing of log table or other material is not allowed.
11. The Answer Sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e. not following the instructions completely, shall be of the candidate only.**
12. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
13. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so would be expelled from the examination.
14. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistant or found giving or receiving assistant or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
15. **Communication equipment such as mobile phones, pager, wireless set, scanner, camera or any electronic/digital gadget etc., is not permitted inside the examination hall. Use of calculators is not allowed.**
16. The candidates will not be allowed to leave the Examination Hall/Room before the expiry of the allotted time.

1. If $8, 2$ are the roots of $x^2 + ax + \beta = 0$ and $2, 3$ are roots of $x^2 + ax + b = 0$ then the roots of $x^2 + ax + b = 0$ are
   A) $8, -1$ B) $-9, 2$ C) $-8, -2$ D) $9, 1$

2. If $\tan x = \frac{b}{a}$, then the value of $a\cos 2x + b\sin 2x$ equals
   A) a B) $a - b$ C) $a + b$ D) b

3. The value of $\sin 10^o + \sin 20^o + \sin 30^0 + \cdots + \sin 350^o$ is
   A) 1 B) -1 C) 0 D) 2

4. The sum of all two digit positive odd numbers is
   A) 2475 B) 2530 C) 4905 D) 5049

5. The tangent to $x^2 + y^2 = 9$, which is parallel to $y-$axis and does not pass through the third quadrant, touches the circle at the point
   A) $(0, -3)$ B) $(0,3)$ C) $(-3,0)$ D) $(3,0)$

6. The acute angle between the lines $ax + by + c = 0$ and $(a + b)x = (a - b)y,\ (a \neq b)$ is
   A) $\frac{\pi}{3}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{2}$

7. The area enclosed between the curves $y = x^2$ and $x = y^2$ is
   A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{1}{6}$ D) 10

8. Let $D = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$, $D_1 = \begin{vmatrix} a_1 + 3b_1 & b_1 + 5c_1 & c_{1+}2a_1 \\ a_2 + 3b_2 & b_2 + 5c_2 & c_2 + 2a_2 \\ a_3 + 3b_3 & b_3 + 5c_3 & c_3 + 2a_3 \end{vmatrix}$, then $\frac{150D - 4D_1}{D}$ equals
   A) 25 B) 26 C) 30 D) 35

9. Using Green's Theorem, the work done by the force field $F(x, y) = y^3\,\hat{\imath} + (x^3 + 3xy^2)\hat{\jmath}$ in moving a particle once in a counter clockwise direction around the circle of radius "a" centred at the origin is given by
   A) $\frac{3a^4\pi}{4}$ B) $\frac{3a^4\pi}{2}$ C) $\frac{a^4\pi}{4}$ D) $\frac{a^4\pi}{2}$

10. An integrating factor for the differential equation $\frac{dy}{dx} + \frac{\cos x}{\sin x}y = \cos x$ is
    A) $\cos x$ B) $\sin x$ C) $\frac{\cos x}{\sin x}$ D) $\frac{\sin x}{\cos x}$

11. The frequency and speed of a wave are 500Hz and 360m/s respectively. If the phase difference between two adjacent particles is 60^o, then distance between them is about:
    A) 0.7 cm B) 12.0 cm C) 70.0 cm D) 120.0 cm

12. Two Nicol prisms are first crossed and them one of them is rotated through 60^o. The percentage of light transmitted is:
    A) 12.5% B) 25.0% C) 37.5% D) 50.0%

13. **The potential difference V across and current I flowing through the instrument in AC circuit are given by V = 5cosωt volts and I = 2sinωt Amperes. The power dissipated in the instrument is**

A) 0W B) 10W C) 5W D) 2.5W

14. **In the process of coalescence of small droplets to a big drop, the surface energy of the system:**

A) Increases B) Decreases

C) Remains unchanged D) May either increase or decrease

15. **In LCR circuit, the sharpness of the resonance curve:**

A) Decreases with increase of inductance L

B) Decreases with increase of capacitance C

C) Doesn't depend upon value of L, C, R

D) Decreases with increase of resistance R

16. **The ionization potential of hydrogen atom is 13.6 volts. The ionization potential of singly ionized helium ion will be:**

A) 54.4eV B) 27.2eV C) 6.8eV D) 3.4eV

17. **Two Carnot engines A and B are joined in series. A accepts heat at 900K and rejects at T Kelvin while B accepts heat at T Kelvin and rejects at 400K. If the efficiency of engines A and B are same then the value of T will be:**

A) 650K B) 600K C) 550K D) 500K

18. **When the $_{88}Ra^{236}$ decays in a series by emission of 3α particles and a β⁻ particle. The daughter nucleus formed will be:**

A) $_{83}Bi^{224}$ B) $_{84}Po^{224}$ C) $_{85}At^{220}$ D) $_{87}Fr^{223}$.

19. **A sample of ferromagnetic material whose volume is $10^{-3}m^3$ is placed in an alternating field of 50Hz. The area of the Hysteresis loop is 0.1MKS units. The loss of energy per hour in Joules will be:**

A) 18 B) 0.005 C) 0.3 D) 0.0072

20. **A body whose displacement (in metres) varies with time t (in seconds) as $y = -\frac{2}{3}t^2 + 16t + 2$ will come to rest after:**

A) 8s B) 10s C) 12s D) 16s

21. **In lead acid battery, the level of electrolyte should be**

A) Equal to that of the plates B) Below the level of the plates

C) Above the level of the plates D) None of these

22. **As per recommendation of ISI the maximum number of points of lights, fans and socket outlets that can be connected in one sub-circuit is**

A) 8 B) 10 C) 15 D) 20

23. The voltage applied to an electric iron was reduced by 50%. The power consumed by the electric iron will be reduced by

A) 50% B) 60% C) 75% D) 25%

24. The resistance of conductor, when its temperature is increased

A) Remains constant B) Decreases

C) Varies D) Increases

25. A length of wire is having a resistance of 1 Ω is cut into four equal parts are bundled together side by side to form wire. The new resistance will be

A) 1/4 Ω B) 1/16 Ω C) 4 Ω D) 16 Ω

26. For a 4% drop in supply voltage, the torque of an induction motor increases by

A) 4 % B) 8% C) 16% D) 2%

27. For d.c. shunt motor, speed control by variation of field flux is best suited for

A) Constant power drive B) Variable power drive

C) Constant torque drive D) Variable torque drive

28. The direction of induced emf in a conductor is given by

A) Right hand thumb rule B) Fleming's right hand rule

C) Right hand thumb rule D) Fleming's left hand rule

29. The core of transformer consists of silicon content with steel to reduce

A) Eddy current losses B) Copper losses

C) Hysteresis losses D) None of these

30. The effective value of induced voltage of transformer is

A) $4.44\ fN\varphi$ B) $4.44\ fN\varphi_m$ C) $4.44\ fN^2\ \varphi_m$ D) $4.44\ f^2\ N\ \varphi_m$

31. The ripple factor of a half wave rectifier is

A) 0.482 B) 0.812 C) 1.21 D) 1.11

32. In a BJT, largest current flows in the

A) Base B) Emitter C) Base and Emitter D) Collector

33. If properly biased, a JFET will act as a

A) Voltage-controlled voltage source B) Current –controlled voltage source

C) Voltage-controlled current source D) Current –controlled current source

34. A differential amplifier is used in the input stage of all op-amps to provide the op-amp with a very high

A) Slew rate B) Bandwidth C) Open-loop gain D) CMRR

35. For sustaining oscillations in an oscillator

A) Feedback factor should be unity B) Phase shift should be unity

C) Feedback should be negative D) Both (A) and (B)

36. The function of two parallel switches is similar to the logic gate

A) NAND gate B) AND gate C) OR gate D) NOR gate

37. In a sequential circuit, the output at any instant of time depend

A) Only on the past output
B) Only on the inputs present at that instant of time
C) Only on the past inputs
D) On past output as well as present inputs

38. The number of flip-flops required for a mod-12 Johnson counter is

A) 6 B) 4 C) 12 D) 24

39. In wire-wound strain gauges, the change resistance on application of strain is mainly due to

A) Change in length of wire B) Change in diameter of wire
C) Change in both length and diameter D) Change in resistivity

40. Which one is an advantage of AM over FM?

A) FM has wide bandwidth
B) Probability of noise spike generation is less in AM
C) FM has better fidelity
D) FM is more immune to noise

41. Which of the following programming language is fastest

A) High-level language B) Machine-level language
C) Assembly language D) Fourth generation language

42. Which of the following Linux shell command is used to display the list of files in the current working directory

A) dir B) cat C) ls D)find

43. What will be the output of the following code:

```
#include <stdio.h>
    void main()
    {
        Int i = 0;
        do
        {
        printf("PU-LEET");
        } while (i != 0);
    }
```

A) PU-LEET is printed infinite times B) PU-LEET is printed once
C) Nothing is printed D) Run-time error

44. In C, array index starts from

A) 0 B) 1 C) -1 D) User specified value

45. In C, the size of the union is determined by the

A) Size of the smallest member of the union
B) Size of the first member of the union
C) Sum of the sizes of all the members of the union
D) Size of the largest member of the union

46. In C, which of the following function writes a character to a text file

A) fgetc B) fread C) fputc D) fwrite

47. Which of the following is a relational operator in C

A) && B) % C) != D) ?:

48. Function overloading is a type of

A) Polymorphism B) Inheritance C) Encapsulation D) Abstraction

49. In C++, the default access specifier for class members is

A) Public B) Private C) Protected D) Public protected

50. Which of the following statement is used to come out of the loop

A) Continue B) Default C) Jump D) Break

51. The state of substance whose evaporation from its liquid state is complete, is known as

A) Vapour B) Perfect gas C) Air D) Steam

52. The efficiency of diesel cycle approaches to Otto cycle efficiency, when cut-off ratio is

A) Zero B) 1/5 C) 4/5 D) 1

53. A body is subjected to a tensile stress of 1200 MPa on one plane and another tensile stress of 600 MPa on a plane at right angles to the former. It is also subjected to a shear stress of 400 MPa on the same planes. The maximum normal stress will be.

A) 400 MPa B) 500 MPa C) 900 MPa D) 1400 MPa

54. A structure used to dam up a stream or river over which the water flows is called

A) Orifice B) Notch C) Weir D) Dam

55. The pressure of liquid flowing through the divergent portion of venturimeter

A) Remains constant B) Increases
C) Decreases D) Depends upon mass of liquid

56. When a rectangular beam is loaded transversely, the maximum compressive stress is developed on the

A) Top layer B) Bottom layer C) Neutral axis D) Every cross-section

57. The ratio of brake power to indicated power is known as

A) Mechanical efficiency B) Overall efficiency
C) Indicated thermal efficiency D) Brake thermal efficiency

58. There is always some steam left in the clearance space from previous stroke. This steam left in [he clearance space is called

A) Wet steam B) Saturated steam
C) Superheated steam D) Cushion steam

59. A pipe of length more than double the diameter of the orifice fitted externally or internally to the orifice is called a

A) Notch B) Weir C) Mouthpiece D) Nozzle

60. Which of the following is an intensive property of a thermodynamic system

A) Volume B) Temperature C) Mass D) Energy

61. Offsets are

A) Lateral measurements made with respect to main survey lines
B) Perpendicular erected from chain lines
C) Taken to avoid unnecessary walking between stations
D) Measurements which are not made at right angles to chain line

62. The most commonly used bond for all the wall thickness

A) English bond B) Flemish bond C) Stretching bond D) Heading bond

63. The silica content in the Portland cement should be

A) 20 to 25% B) 35 to 45% C) 15 to 20% D) 45 to 60%

64. For preparing 100 cu.m of 1:2:4 cement concrete, the requirement of cement would be

A) 14 cu.m B) 16 cu.m C) 18 cu.m D) 21cu.m

65. On a single lane road with two way traffic, the minimum stopping sight distance is equal to

A) Stopping distance B) Two times the stopping distance
C) Half the stopping distance D) Three times the stopping distance

66. The neutral axis of a balanced section is called as

A) Critical neutral axis B) Balanced neutral axis
C) Equivalent neutral axis D) Major neutral axis

67. Failure of column depends on

A) Weight of column B) Length of column
C) Cross sectional area of column D) Slenderness ratio of column

68. The liquid limit exists in

A) Sandy soils B) Gravel solis C) Silty soils D) Clays

69. A land is said to be water logged if

A) Air circulation is stopped in the root zone due to rise in water table
B) It is submerged in flood
C) Soil pores within a depth of 40 cm are saturated
D) Soil is eroded

70. The property of fluid which offers resistance to movement of one layer of liquid over another adjacent layer of liquid is called

A) Surface tension B) Compressibility C) Capillarity D) Viscosity

71. Which one the following is not biodegradable?

A) Vegetables B) Fruits C) Earthworm D) Aluminium foil

72. Air pollution is caused by

A) Insecticides B) Sewage C) Smoke D) Loud speakers

73. If waste materials contaminate the source of drinking water which of the following diseases will spread?

A) Scurvy B) Typhoid C) Malaria D) Anaemia

74. Process through which plants reproduce:

A) Eating B) Evaporation C) Pollination D) Condensation

75. At what time of day the relative humidity normally at a minimum?

A) When the air temperature is highest B) Just before sunrise

C) About midnight D) When the air temperature is lowest

x-x-x