

**PULEET – 2016**

**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*

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O.M.R. Answer Sheet Serial No.

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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:**

- Write your Roll No. on the Questions Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
- Enter the Question Booklet Serial No. on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point/Black Gel Pen**.
- Do not make any identification mark on the Answer Sheet or Question Booklet.
- 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.
- 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,  $\frac{1}{4}$  of the marks of the question will be deducted for every wrong answer.**
- 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.
- Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the question given in the Question Booklet.
- If you want to change an already marked answer, erase the shade in the darkened bubble completely.
- For rough work only the blank sheet at the end of the Question Booklet be used.
- The University will provide logarithmic tables. Borrowing of log table or other material is not allowed.
- 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.**
- After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
- 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.
- 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.
- 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.
- The candidates will not be allowed to leave the Examination Hall/Room before the expiry of the allotted time.





10. The directional derivative of the function  $f(x, y, z) = xy^2 + yz^3$  at the point  $(2, -1, 1)$  in the direction of the vector  $\hat{i} + 2\hat{j} + 2\hat{k}$  is:
- A)  $11/3$                       B)  $10/3$                       C)  $-10/3$                       D)  $-11/3$
11. A solid sphere of mass 50 grams and diameter 2cm rolls, without sliding, with uniform velocity of 5cm/s along a straight line on a smooth horizontal table. The total energy of its motion is
- A)  $87.5 \times 10^{-6} \text{J}$                       B)  $25 \times 10^{-6} \text{J}$   
 C)  $250 \times 10^{-6} \text{J}$                       D)  $62.5 \times 10^{-6} \text{J}$
12. The frequency and speed of a wave are 500Hz and 350m/s respectively. If the phase difference between two adjacent particles of the medium is  $60^\circ$ , then distance between them will be:
- A) 0.7 cm                      B) 12.0 cm                      C) 70.0 cm                      D) 120.0 cm
13. Two Nicol prisms are first crossed and then one of them is rotated through an angle of  $60^\circ$ . The percentage of light transmitted through the Nicol prism is:
- A) 12.5%                      B) 25.0%                      C) 37.5%                      D) 50.0%
14. Two cells, each of emf  $E$  and internal resistance  $r$ , are connected in parallel with resistance  $R$ . The maximum energy delivered by the cells to the circuit will be:
- A)  $\frac{E^2}{r}$                       B)  $\frac{4E}{r^2}$                       C)  $\frac{4E^2}{r}$                       D)  $\frac{E^2}{4r}$
15. The potential difference  $V$  across the instrument in AC circuit is given by  $V = 5 \cos \omega t$  volts while the current  $I$  flowing through it is given as  $I = 2 \sin \omega t$  amperes. The power dissipated in the instrument is
- A) 2.5W                      B) 10W                      C) 5W                      D) 0W
16. A spectral line appearing at a wavelength of 500nm in the laboratory is observed as 550nm in the spectrum of the light coming from a distant galaxy. The recessional velocity of the galaxy is:
- A)  $\sim 10^9 \text{ cm/s}$                       B)  $\sim 3 \times 10^9 \text{ cm/s}$   
 C)  $\sim 2 \times 10^9 \text{ cm/s}$                       D)  $\sim 0.5 \times 10^9 \text{ cm/s}$
17. A photon of energy 14.05eV ionizes the hydrogen atom in its ground state. The velocity of the electron ejected out of the atom will be:
- A)  $4.0 \times 10^5 \text{ m/s}$                       B)  $4.0 \times 10^6 \text{ m/s}$   
 C)  $8.0 \times 10^5 \text{ m/s}$                       D)  $9.9 \times 10^6 \text{ m/s}$
18. The  ${}_{88}\text{Ra}^{226}$  nucleus decays in a series by emission of  $3\alpha$  particles and a  $\beta$  particle. The daughter nucleus formed will be:
- A)  ${}_{83}\text{Bi}^{224}$                       B)  ${}_{84}\text{Po}^{224}$                       C)  ${}_{85}\text{At}^{220}$                       D)  ${}_{87}\text{Fr}^{223}$

19. Silver crystal has unit cell with Face Centered Cubic structure. If inter-atomic separation between atoms 0.288nm then lattice constant is

- A) 0.204nm      B) 0.408nm      C) 10.0nm      D) 0.144nm

20. For a given thermocouple, the cold junction temperature is  $10^{\circ}\text{C}$  and its neutral temperature is  $285^{\circ}\text{C}$ . The temperature of inversion for this thermocouple is:

- A)  $137.5^{\circ}\text{C}$       B)  $560^{\circ}\text{C}$       C)  $147.5^{\circ}\text{C}$       D)  $570^{\circ}\text{C}$

21. When superposition theorem is applied to any circuit, the dependant voltage source is always

- A) Opened      B) Shorted      C) Active      D) None of these

22. The initial permeability of an iron rod is

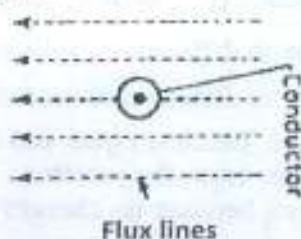
- A) The permeability almost in non-magnetized state  
B) The lowest permeability of the iron rod  
C) The highest permeability of the iron rod  
D) The permeability at the end of the rod

23. Power factor of the following circuit will be zero when the circuit contains

- A) Capacitance only      B) Inductance only  
C) Either of A or B      D) Resistance only

24. A current carrying conductor placed in the magnetic field as shown in figure below. The force experienced on the conductor acts

- A) Upward  
B) Downward  
C) To the left  
D) To the right



25. The instantaneous values of the currents in both phase B and C of a 3- $\phi$  system are 10 Amp, for a phase sequence of ABC. The instantaneous value of phase A is

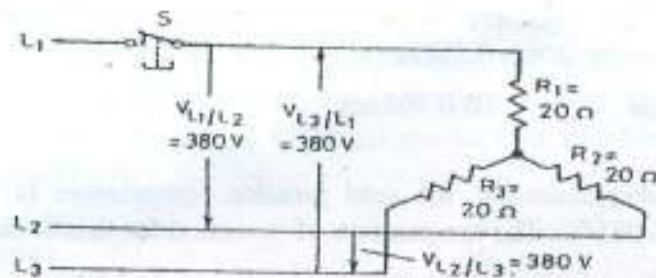
- A) 17.32 A      B) 10 A      C) 20 A      D) 34.64 A

26. If in a transformer the secondary turns are doubled and at the same time the primary voltage is reduced by half, then the secondary voltage will

- A) Be halved      B) Be four times as high  
C) Not change      D) Be reduced to a one fourth



27. Three resistances, are connected to a three phase generator as shown in figure. What is the voltage value across each of the resistances  $R_1$ ,  $R_2$  and  $R_3$  which have the same values?



- A) 380 V  
 B)  $380V/2 = 190V$   
 C)  $380V \times \sqrt{3} = 657V$   
 D)  $380V/\sqrt{3} = 220 V$
28. Voltage equation of a dc motor is
- A)  $V = E_b + I_a R_a$   
 B)  $E_b = V + I_a R_a$   
 C)  $V = E_b - I_a R_a$   
 D)  $V = E_b + I_a^2 R_a$
29. The starting winding of a single-phase motor is placed in
- A) Rotor  
 B) Stator  
 C) Armature  
 D) Field
30. If the readings of the two wattmeters in the 2-wattmeter method of power measurement are 4.5 kW and 3.5 kW respectively and the latter reading has been obtained after reversing the current coil of the wattmeter. What will be the total power in kW?
- A) 1  
 B) 3.5  
 C) 4.5  
 D) 8
31. In an unbiased p-n junction, the junction current at equilibrium is
- A) Due to diffusion of minority carriers only  
 B) Due to diffusion of majority carriers only  
 C) Zero, because equal and opposite drift and diffusion currents for electrons and holes cross the junction  
 D) Zero, because no charges cross the junction
32. A small increase in collector reverse bias will cause
- A) A large increase in emitter current  
 B) A large increase in collector current  
 C) A large decrease in collector current  
 D) Very small change in collector reverse saturation current

33. Early effect in BJT refers to

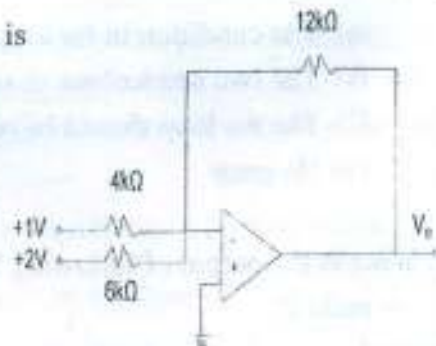
- A) Base narrowing
- B) Avalanche breakdown
- C) Thermal runaway
- D) Zener breakdown

34. The power consumption is least in CMOS circuits as compared to NMOS and PMOS circuits. This is because, in CMOS

- A) Both the transistors remain in off-state most of the time
- B) Both the transistors go to on-state simultaneously only for a very short time during change of states.
- C) Small voltages are required
- D) High value resistors are used

35. In the circuit shown, the output voltage,  $V_o$ , is

- A) +3V
- B) -3V
- C) -7V
- D) +7V



36. In a CRO which of the following is not a part of electron gun

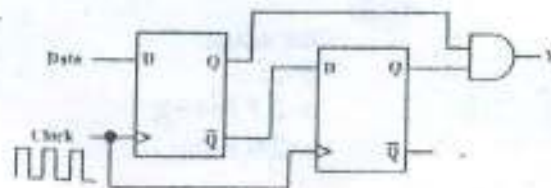
- A) Cathode
- B) Control grid
- C) Accelerating anode
- D) X - Y deflection plates

37. Suppose  $V_x = \sin(t)$ ,  $V_y = \cos(t)$  are applied to the horizontal and vertical deflection plates respectively in X-Y mode. Which of pattern is formed on the CRO screen?

- A) Ellipse
- B) Circle
- C) Line inclined at 45deg
- D) Sine Wave

38. When the output Y in the circuit below is "1", it implies that data has

- A) Changed from "0" to "1"
- B) Changed from "1" to "0"
- C) Changed in either direction
- D) Not changed



39. The household energy meter is

- A) Indicating instrument
- B) Recording instrument
- C) Integrating instrument
- D) None of these

40. According to the International Telecommunications Union an amplitude-modulated analog TV would be classified as

- A) A3F
- B) J3E
- C) F2D
- D) G7E

41. In the following 'C' program, find out the error, if any?

```
main()
{
    int i = 1;
    for (;;)
    {
        printf("%d", i++);
        if(i>10)
            break;
    }
}
```

- A) The condition in for loop is must
- B) The two semicolons should be dropped
- C) The for loop should be replaced by while loop
- D) No error

42. What is the output of following 'C' program?

```
main ()
{
    const int x=5;
    int*ptrx;
    ptrx= &x;
    *ptrx=10;
    printf("%d". x);
}
```

- A) 5
- B) 10
- C) Error
- D) Garbage Value

43. Consider the following program:

```
main()
{
    int a,b,c;
    b=2;
    a=2 * (b++);
    c=2*(++b);
}
```

Which of the following is correct?

- A) a=4,c=6
- B) a=3,c=8
- C) b=3,c=6
- D) a=4,c=8



44. Consider the following program;

```
switch(choice) {  
  case 'R' : printf ("RED");  
  case 'W' : printf ("WHITE");  
  case 'B' : printf ("BLUE");  
  default: printf ("ERROR");  
          break;  
}
```

What would be the output if choice = 'R'?

- A) RED  
B) RED ERROR  
C) RED WHITE BLUE ERROR  
D) RED WHITE BLUE

45. Which of the following is correct statement related to L2 cache memory?

- A) The L1 cache is always faster than L2 cache.  
B) The L2 cache is used to mitigate the dynamic slowdown every time a L1 cache miss occurs.  
C) L2 cache comes as on board only.  
D) In modern day computer, L2 cache is considered as internal cache.

46. What does the following 'C' statement declare? `int (*f) (int*);`

- A) A function that takes an integer pointer as argument and returns an integer.  
B) A function that takes an integer as argument and returns an integer pointer.  
C) A pointer to a function that takes an integer pointer as argument and returns an integer.  
D) A function that takes an integer pointer as argument and returns a function pointer

47. Consider the following 'C' function

```
void swap (int a, int b)  
{  
  int temp;  
  temp = a;  
  a=b;  
  b=temp;  
}
```

In order to exchange the values of two variables x and y:

- A) Call `swap(x, y)`  
B) Call `swap(&x, &y)`  
C) `swap(x, y)` cannot be used as it does not return any value  
D) `swap(x, y)` cannot be used as parameters are passed by value



48. Which of the following memories must be refreshed many times per second?
- A) Static RAM  
B) Dynamic RAM  
C) EPROM  
D) ROM
49. A computer program that converts an entire program into machine language is called what?
- A) Interpreter  
B) Simulator  
C) Compiler  
D) Commander
50. Kernel is that part of operating system which
- A) Directly makes interface with hardware system  
B) Indirectly makes interfaces with hardware system  
C) Indirectly makes interfaces with software system  
D) None of the above
51. In which cycle, compression ratio is the highest
- A) Diesel cycle  
B) Brayton cycle  
C) Rankine cycle  
D) Otto cycle
52. Mollier diagram consists of the following components: -
- A) Enthalpy and volume  
B) Temperature and entropy  
C) Enthalpy and entropy  
D) Enthalpy and temperature
53. Which of the following materials has zero ductility?
- A) Steel  
B) Brass  
C) Cast iron  
D) Chalk
54. A material has Poisson's ratio 0.25. The ratio of its Young's modulus to modulus of rigidity is:
- A) 1.5  
B) 1.25  
C) 2.5  
D) 1
55. Hooke's law is valid for
- A) Ductile materials  
B) Brittle materials  
C) Isotropic materials  
D) Isotropic and homogeneous materials
56. The equivalent bending moment in case of a shaft being subjected to bending moment  $M$  and twisting moment  $T$ , is:
- A)  $\frac{1}{2}[M + \sqrt{M^2 + T^2}]$   
B)  $\frac{1}{2}\sqrt{M^2 + T^2}$   
C)  $\sqrt{M^2 + T^2}$   
D)  $\frac{1}{2}[M - \sqrt{M^2 + T^2}]$
57. Stoke is the unit of
- A) Kinematic viscosity  
B) Dynamic viscosity  
C) Surface tension  
D) Power of a turbine

58. Pilot tube is used to measure
- A) Pressure difference  
B) Surface tension  
C) Velocity of flowing liquid  
D) Acceleration of flowing liquid
59. For subsonic velocity, Mach number is
- A) Equal to one  
B) Equal to zero  
C) Less than one  
D) Greater than one
60. The variation of shear stress with respect to radius in a circular shaft is shown by a
- A) Parabola  
B) Straight line  
C) Cubic curve  
D) Hyperbola
61. As per IS-456 Nominal Maximum size of coarse aggregate in no case greater than:
- A) One-fourth of the minimum thickness of the member  
B) One-third of the minimum thickness of the member  
C) One-fifth of the minimum thickness of the member  
D) One-fifth of the spacing of reinforcement
62. The pH value of water for the construction purpose:
- A) Shall not be less than 6  
B) Shall not be less than 6.5  
C) Shall not be more than 8  
D) Shall be equal to 7
63. The degree of workability of concrete for the pumpable condition for placing of concrete is:
- A) High  
B) Medium  
C) Very High  
D) Low
64. Minimum Period for striking off the props of formwork to slabs spanning over 4.5m span is:
- A) 7 days  
B) 3 days  
C) 14 days  
D) 10 days
65. Minimum cement content for M20 grade of concrete shall be:
- A) 250 kg/m<sup>3</sup> of concrete  
B) 260 kg/m<sup>3</sup> of concrete  
C) 220 kg/m<sup>3</sup> of concrete  
D) 240 kg/m<sup>3</sup> of concrete
66. The order of booking dimensions is:
- A) Length, breadth, height  
B) Breadth, length, height  
C) Height, breadth, length  
D) None of these
67. As per Indian Standard Specifications, the peak discharge for domestic purposes per capita per minute, is taken:
- A) 1.80 litres for 5 to 10 users  
B) 1.20 litres for 15 users  
C) 1.35 for 20 users  
D) All the above



68. Pick up the item of work not included in the plinth area estimate:
- |                   |                  |
|-------------------|------------------|
| A) Wall thickness | B) Verandah area |
| C) Courtyard area | D) None of these |
69. Brick walls are measured in sq. m if the thickness of the wall is:
- |         |                  |
|---------|------------------|
| A) 10cm | B) 20cm          |
| C) 15cm | D) None of these |
70. The height of the sink of wash basin above floor level is kept:
- |          |                |
|----------|----------------|
| A) 60 cm | B) 70 to 75 cm |
| C) 80cm  | D) 75 to 80 cm |
71. All sources of water such as the oceans, lakes, rivers and underground water together constitute:
- |                |               |
|----------------|---------------|
| A) Hydrosphere | B) Atmosphere |
| C) Lithosphere | D) Biosphere  |
72. The interdependence of the living organisms among themselves and with the environment is called
- |            |              |            |              |
|------------|--------------|------------|--------------|
| A) Ecology | B) Ecosystem | C) Biology | (D) Antology |
|------------|--------------|------------|--------------|
73. The total area of India is classified into following number of biogeographical zones
- |        |          |         |        |
|--------|----------|---------|--------|
| A) Six | B) Eight | C) Nine | D) Ten |
|--------|----------|---------|--------|
74. Which of the following is a Ramsar site in India?
- |                |               |
|----------------|---------------|
| A) Sambar lake | B) Dal lake   |
| C) Ansupa lake | D) Dimna lake |
75. Vermicomposting is a method of composting that involves
- |               |              |
|---------------|--------------|
| A) Tapeworms  | B) Silkworms |
| C) Earthworms | D) Leeches   |

x-x-x