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# ENTRANCE TEST-2021

SCHOOL OF ENGINEERING  
B.TECH. LATERAL ENTRY

Question Booklet Series

**D**

Roll No. :

84024

Total Questions : 60  
Time Allowed : 70 Minutes

### Instructions for Candidates :

1. Write your Roll Number in the space provided at the top of this page of Question Booklet and fill up the necessary information in the spaces provided on the OMR Answer Sheet.
2. OMR Answer Sheet has an Original Copy and a Candidate's Copy glued beneath it at the top. While making entries in the Original Copy, candidate should ensure that the two copies are aligned properly so that the entries made in the Original Copy against each item are exactly copied in the Candidate's Copy.
3. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. Use only blue/black ball point pen to darken the circle of correct/most appropriate response. In no case gel/ink pen or pencil should be used.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be 'Negative Marking' for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
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10. Calculators and mobiles shall not be permitted inside the examination hall.
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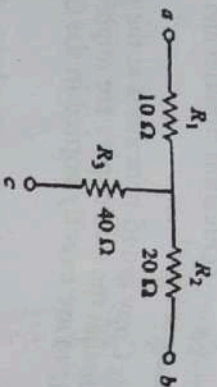
Turn over



1. How much energy does a 100 W electric bulb consume in 2 hours?

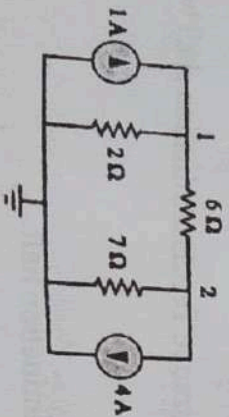
- (A) 720 KJ ✓
- (B) 300 W/h
- (C) 600 KJ
- (D) 100 W/h

2. Transform the wye network in Fig. to a delta network:



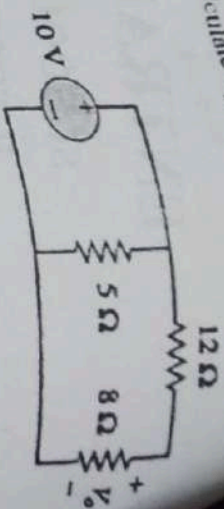
- (A)  $R_a = 140 \text{ ohm}, R_b = 70 \text{ ohm}, R_c = 35 \text{ ohm}$  ✓
- (B)  $R_a = 120 \text{ ohm}, R_b = 60 \text{ ohm}, R_c = 25 \text{ ohm}$
- (C)  $R_a = 100 \text{ ohm}, R_b = 50 \text{ ohm}, R_c = 35 \text{ ohm}$
- (D)  $R_a = 140 \text{ ohm}, R_b = 40 \text{ ohm}, R_c = 30 \text{ ohm}$

3. Obtain the node voltages in the circuit:



- (A)  $v_1 = -2 \text{ V}, v_2 = -10 \text{ V}$
- (B)  $v_1 = -2 \text{ V}, v_2 = -12 \text{ V}$
- (C)  $v_1 = -4 \text{ V}, v_2 = -10 \text{ V}$
- (D)  $v_1 = -4 \text{ V}, v_2 = -14 \text{ V}$  ✓

4. Calculate  $V_o$ :

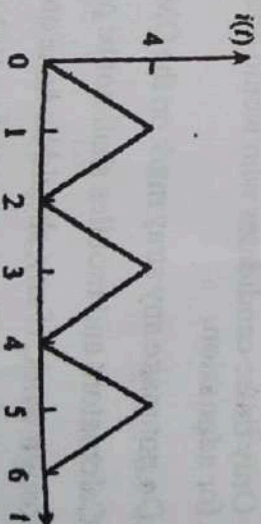


- (A) 2V
- (B) 3V
- (C) 4V ✓
- (D) 5V

Source transformation is:

- (A) A procedure for transforming a voltage source in parallel with a resistor to a current source in parallel with a resistor
- (B) A procedure for transforming a voltage source in series with a resistor to a current source in parallel with a resistor ✓
- (C) A procedure for transforming a voltage source in series with a resistor to a current source in series with a resistor
- (D) A procedure for transforming a voltage source in parallel with a resistor to a current source in series with a resistor

6. Find rms value of current waveform in figure:

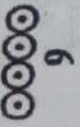


- (A) 3.309 A
- (B) 2.309 A ✓
- (C) 4.509 A
- (D) 4 A

7. An electric iron draws 2 A at 120 V. Find its resistance :
- (A) 30 ohm  
(B) 40 ohm  
(C) 50 ohm  
(D) 60 ohm ✓
8. Voltage is measured in :
- (A) Watts  
(B) Amperes  
(C) Volts ✓  
(D) Joules per second
9. When the line intersects horizontal plane, it is called :
- (A) Horizontal trace ✓  
(B) Vertical trace  
(C) Trace of a line  
(D) None of these
10. Isometric dimensioning uses DIM command with :
- (A) Oblique option ✓  
(B) Horizontal option  
(C) Both the above  
(D) None of the above
11. If a block is to be used in another drawing file, the command to save the block is :
- (A) INSERT  
(B) BLOCK  
(C) WBLOCK ✓  
(D) MININSERT
12. When a plane has its surface parallel to VP and perpendicular to HP. The top view is always a :
- (A) Square  
(B) Triangle  
(C) Polygon  
(D) Straight line ✓
13. To draw a side view, an auxiliary vertical plane is imagined to be placed :
- (A) Perpendicular to both H.P. and V.P. ✓  
(B) Perpendicular to H.P. and parallel to V.P.  
(C) Perpendicular to V.P. and parallel to H.P.  
(D) None of the above
14. The flank angle of a Buttress thread is :
- (A) 55° and 45°  
(B) 45°  
(C) 47½°  
(D) 45° and 7° ✓
15. One of the uses of the concept of centroid is, as in the simplification of the loading system the net force acts at the \_\_\_\_\_ of the loading body.
- (A) Centroid ✓  
(B) The centre axis  
(C) The corner  
(D) The base
16. A steel bar of 40 mm × 40 mm square section is subjected to an axial compressive load of 200 KN. If the length of the bar is 2 mm and  $E = 200 \text{ GPa}$ , the elongation of the bar will be :
- (A) 1.25 mm ✓  
(B) 2.70 mm  
(C) 4.05 mm  
(D) 5.40 mm
17. If the value of Poisson's ratio is zero, then it means that :
- (A) The material is rigid ✓  
(B) The material is perfectly plastic  
(C) There is no longitudinal strain in the material  
(D) The longitudinal strain in the material is infinite

18. What are the materials which show direction dependent properties, called ?
- (A) Homogeneous materials
  - (B) Viscoelastic materials
  - (C) **Isotropic materials**
  - (D) Anisotropic materials
19. A 100 mm × 5 mm × 5 mm steel bar free to expand is heated from 15°C to 40°C. What type of stress will be developed in the said bar ?
- (A) Tensile stress
  - (B) Compressive stress
  - (C) Shear stress
  - (D) **No stress**
20. A steel rod 10 mm in diameter and 1 m long is heated from 20°C to 120°C, E = 200 GPa and thermal coefficient of linear expansion is  $12 \times 10^{-6}$  per degree Celsius. If the rod is not free to expand, the thermal stress developed is :
- (A) 120 MPa (tensile)
  - (B) 240 MPa (tensile)
  - (C) 120 MPa (compressive)
  - (D) **240 MPa (compressive)**
21. Molecular orbitals are :
- (A) Monocentric
  - (B) Bicentric
  - (C) **Polycentric**
  - (D) None of the above
22. Bonding in metals have been explained by :
- (A) Electron pool theory
  - (B) Valence bond theory
  - (C) **Molecular orbital theory (band theory)**
  - (D) All of the above
23. A polymer made up of more than one type of monomer is termed as :
- (A) Homopolymer
  - (B) **Copolymer**
  - (C) Homochain polymer
  - (D) Heterochain polymer
24. Rubber is vulcanised to improve its properties by heating with :
- (A) **Sulphur**
  - (B) Carbon
  - (C) Silica
  - (D) Alumina
25. The number of signals and multiplicity of the signals in  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-NH}_2$  will be :
- (A) **4 signals; singlet (2H), triplet (2H), triplet (3H), sextet (2H)**
  - (B) 3 signals; singlet (2H), quartet (4H), quintet (3H)
  - (C) 4 signals; singlet (2H), triplet (2H), triplet (3H), quintet (2H)
  - (D) 2 signals; octet (2H), triplet (7H)
26. Which of the following compounds will exhibit NMR spectroscopy ?
- (A)  ${}^6\text{C}^{12}$
  - (B)  ${}^8\text{O}^{16}$
  - (C)  ${}^{16}\text{S}^{32}$
  - (D)  **${}^6\text{C}^{13}$**

27. The type of lubrication under conditions of low speed and high load is :  
 (A) Thick film or hydrodynamic lubrication  
 (B) **Thin film or boundary lubrication**  
 (C) High pressure lubrication  
 (D) All of the above
28. A good lubricating oil should have :  
 (A) **High viscosity index**  
 (B) Low viscosity index  
 (C) High/Low viscosity index  
 (D) Moderate viscosity index
29. The change in the wavelength ( $\lambda_p$ ) of a scattered photon from an electron, such that the recoil electron makes an angle of zero degrees with the horizontal or moves parallel to the incident photon trajectory is :  
 (A) Maximum  
 (B)  $2 \lambda_p$   
 (C)  $\frac{1}{2} \lambda_p$   
 (D) **0**
30. Stefan's law states that the energy radiated per unit time of black body is proportional to (Given A is the area and T is the temperature) :  
 (A)  $AT^3$   
 (B)  $AT^{-4}$   
 (C)  **$AT^4$**   
 (D)  $AT^{-3}$
31. The maximum probability of finding the particle between two limits is :  
 (A) Zero  
 (B) Less than one but greater than zero  
 (C) More than one  
 (D) **One**
32. The energy ( $E_n$ ) of a harmonic oscillator, corresponding to  $n = 0$  is equal to :  
 (A)  **$h\nu/2$**   
 (B)  $h \frac{\nu}{2}$   
 (C)  $3h\nu$   
 (D)  $3h\nu/2$
33. Heisenberg's uncertainty principle states that the :  
 (A) Uncertainties in energy and time  $\geq h/2$   
 (B) Uncertainties in momentum and position  $\geq h/2$   
 (C) **Both (A) and (B)**  
 (D) None of these
34. Electron Volt (eV) is the unit of :  
 (A) Power  
 (B) Potential difference  
 (C) **Energy**  
 (D) Force
35. The Planck's radiation law is given by :  
 (A)  $\frac{8\pi h\nu^4 dv}{c^3 e^{h\nu/kT} - 1}$   
 (B)  $\frac{8\pi h\nu^2 dv}{c^2 e^{h\nu/kT} - 1}$   
 (C)  $\frac{8\pi h\nu^2 dv}{c^3 e^{h\nu/kT} - 1}$   
 (D)  **$\frac{8\pi h\nu^3 dv}{c^3 e^{h\nu/kT} - 1}$**



36. Which law removed the ultraviolet catastrophe in Rayleigh-Jeans law ?
- (A) Wien's Displacement Law  
 (B) Stefan's Radiation Law  
 (C) Planck's Radiation Law  
 (D) All of these
37. The solution of the differential equation  $a(p + q) = z$  is :
- (A)  $\phi(x - y, y - az) = 0$   
 (B)  $\phi(x + y, y + az) = 0$   
 (C)  $\phi(x - y, y + az) = 0$   
 (D)  $\phi(x + y, y - az) = 0$
38. The solution of the differential equation  $(D^2 + a^2)y = 0$  is :
- (A)  $c_1 \cos ax + c_2 \sin ax$   
 (B)  $c_1 \cos ax - c_2 \sin ax$   
 (C)  $(c_1 + c_2 x) \sin ax$   
 (D)  $(c_1 + c_2 x) \cos ax$
39. The particular integral of the differential equation  $(D^2 + 1)y = \cos 2x$  is :
- (A)  $\frac{1}{3} \sin 2x$   
 (B)  $-\frac{1}{3} \sin 2x$   
 (C)  $-\frac{1}{3} \cos 2x$   
 (D)  $\frac{1}{3} \cos 2x$
40. The solution of the differential equation  $(x^2 y)'' - xD^2 + 2y = 0$  is :
- (A)  $x(c_1 \cos(\log x) - c_2 \sin(\log x))$   
 (B)  $x(c_1 \cos(\log x) + c_2 \sin(\log x))$   
 (C)  $(c_1 \cos(\log x) - c_2 \sin(\log x))$   
 (D)  $(c_1 \cos(\log x) + c_2 \sin(\log x))$
41. The Frobenius method can be used about a point  $x = a$  if :
- (A)  $x = a$  is a regular point  
 (B)  $x = a$  is an irregular point  
 (C) Both (A) and (B)  
 (D) None of these
42. The differential equation  $x^2 y'' + xy' + (x^2 - n^2)y = 0$  where  $2n$  is non integral is known as :
- (A) Hermite's Equation  
 (B) Legendre's Equation  
 (C) Bessel's Equation  
 (D) None of the above
43. The most general solution of the wave equation is :
- (A)  $y = (A \cos \sqrt{kx} + B \sin \sqrt{kx})(C \cos \sqrt{kx} + D \sin \sqrt{kx})$   
 (B)  $y = (A \cos \sqrt{kx} + B \sin \sqrt{kx}) + (C \cos \sqrt{kx} + D \sin \sqrt{kx})$   
 (C)  $y = (A \cos \sqrt{kx} - B \sin \sqrt{kx})(C \cos \sqrt{kx} + D \sin \sqrt{kx})$   
 (D) None of the above

ST-9998-D



Turn over

44. The partial differential equation  $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$

represents :

- (A) One dimensional wave equation
- (B) One dimensional heat equation
- (C) Two dimensional wave equation
- (D) Two dimensional heat equation

45. Consider the following statements about direct and indirect band gap semiconductors :

- 1) Indirect band gap semiconductors can be used in solar cells because carrier recombination is harder due to the misalignment between the valence band maximum and conduction band minimum
- 2) Direct band gap semiconductors can be used in solar cells because only energy is required (in the form of photons) to generate electron-hole pairs.
- 3) Indirect band gap semiconductors can be used in LEDs because carrier recombination is harder due to the misalignment between the valence band maximum and conduction band minimum.
- 4) Direct band gap semiconductors can be used in LEDs because carrier recombination is easy.

Which of the following is correct ?

- (A) 1), 2) and 4) are correct
- (B) Only 1) is correct
- (C) Only 3) and 4) are correct
- (D) Only 1) and 2) are correct

46. Which of the following statement(s) accurately captures the difference in the origin of Zener breakdown and Avalanche breakdown ?

- 1) Electric field involved in Avalanche breakdown is high while electric field involved in Zener breakdown is low.
  - 2) Zener breakdown involves a narrow depletion region while Avalanche breakdown involves a thick depletion region.
  - 3) Zener breakdown involves a thick depletion region while Avalanche breakdown involves a narrow depletion region.
  - 4) Electric field involved in Zener breakdown is high while electric field involved in Avalanche breakdown is low.
- (A) 1), 3) and 4) are correct  
(B) 2) and 4) are correct  
(C) Only 1) is correct  
(D) Only 4) is correct

47. Consider a silicon diode at room temperature, how much should the forward voltage increase to raise the current by a factor of 10 ?

- (A) 100 mV
- (B) 26 mV
- (C) 60 mV
- (D) 0.7 V

48. The ripple Amplitude of full wave Rectifier is \_\_\_\_\_ times the ripple amplitude of half wave Rectifier.

- (A) 1/2
- (B) 2
- (C) 0.4
- (D) 0.51

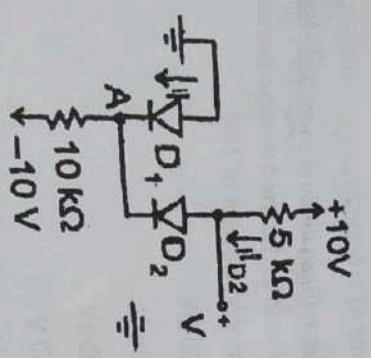


49. In a BJT biased in the active mode, the base current is  $6 \mu\text{A}$ , and the collector current is  $510 \mu\text{A}$ . The value of  $\alpha$  is :
- (A) 0.5
  - (B) 0.92
  - (C) 0.988
  - (D) 0.965

50. Which of the following is correct for an npn transistor to act in Active region ?

- (A)  $V_{CE} < V_{BE}$
- (B)  $V_{BE} > V_{CE}$
- (C)  $V_{CE} - V_{BE} < 0$
- (D) Option (B) and (C) are both correct

51. Assume the diodes are ideal, calculate the value of I and V for the circuit shown below :



- (A) 2 mA, 0 V
- (B) 2 mA, 3.3 V
- (C) None of these
- (D) 0 mA, 3.3 V

ST-9998-D

52. The drift velocity of electrons in silicon varies with applied electric field in which one of the ways ?

- (A) It monotonically increases with increasing field
- (B) It first increases, then decreases showing a negative differential region, again increases and finally saturates
- (C) It first increases linearly, then sub-linearly and finally attains saturation with increasing field
- (D) The direct velocity remains unchanged with increase in field

53. Consider the following statements about computer memory:

- I) RAM is an example of secondary storage device and stores data permanently.
  - II) USB Drive is an example of Solid-State storage device and is volatile in nature.
  - III) Hard disk and CD ROM belong to class of non-volatile memories.
- Which of the above statements is True ?

- (A) Only I is True
- (B) Only II is True
- (C) Only III is True
- (D) All three statements are True

54. Which of the following statements is True ?

- (A) Windows and Linux are the examples of Application Software
- (B) 'C' Language belongs to object oriented programming language category
- (C) Compiler converts program written in machine code into high level language
- (D) Microsoft Word and Adobe PageMaker are examples of application software

Turn over



55. Which of the following statement about computer ports is True ?

- (A) USB stands for Universal Serial Bus and supports only single device at a time
- (B) VGA connector is a standard connector used for computer video output
- (C) HDMI stands for High Density Magnetic Interface and allows port to only send very low resolution videos to other compatible devices
- (D) RJ-45 is not suitable Ethernet networking

56. Which of the following belongs to class of Operating System ?

- (A) Mozilla Firefox
- (B) Microsoft Word
- (C) Adobe PageMaker
- (D) Linux

57. What will be the output of the following C program ?

```
int main ()
{
    int a=0;
    a=5<2 ? 1 : 2;
    printf("%d", a);
    return 0;
}
```

- (A) 5
- (B) 2
- (C) 1
- (D) None of the above

58. What will be the output of the following C program ?

```
int main ()
{
    int a=1;
    while(a<10)
    {
        printf("hello");
        break;
    }
    return 0;
}
```

- (A) Hello
- (B) hello hello
- (C) hello hellohellohello
- (D) hello break

59. What will be the output of the following C program ?

```
int main ()
{
    int a=5;
    do
    {
        printf("%d", a);
        a=a+5;
        if (a>20)
            break;
    } while (1);
    return 0;
}
```

- (A) 5 10
- (B) 5 10 15
- (C) 5 10 15 20
- (D) None of these

60. The C language keyword which is used to transfer control from a function back to the calling function is :

- (A) return
- (B) goto
- (C) getch()
- (D) main

**ENTRANCE TEST-2022**  
**School of Engineering**  
**B.Tech./BE Lateral Entry**

*Roll*

Sr. No. ....

0066

Total Questions : 60  
Time Allowed : 70 Minutes

Roll No.

641067

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14. If any of the information in the response Sheet/Question Paper has been found missing or not mentioned as stated above the candidate is solely responsible for that lapse.

SEAL

1. What is the partial differential of  $z = \phi(x + y)$  where  $\phi$  is an arbitrary function?

- a)  $\frac{\partial z}{\partial x} = \frac{\partial z}{\partial y}$
- b)  $\frac{\partial z}{\partial x} = y \frac{\partial z}{\partial x}$
- c)  $\frac{\partial z}{\partial x} = x \frac{\partial z}{\partial x}$
- d)  $\frac{\partial z}{\partial x} = \phi(x) \frac{\partial z}{\partial x}$

2. Which of the following partial differential equation is Lagrange's equation?

- a)  $p^2 x^2 + q^2 y^2 + r^2 z^2 = R(x, y, z)$
- b)  $p^2 x^2 + q^2 y^2 + r^2 z^2 = R(x, y, z)$
- c)  $p^2 x^2 + q^2 y^2 + r^2 z^2 = R(x, y, z)$
- d) None of these

3. What is the Lagrange's auxiliary equation for  $x^2 p + y^2 q + z^2 r = 0$ ?

- a)  $\frac{dx}{x^2} = \frac{dy}{y^2} = \frac{dz}{z^2}$
- b)  $\frac{dx}{x^2} = \frac{dy}{y^2} = \frac{dz}{z^2}$
- c)  $\frac{dx}{x^2} = \frac{dy}{y^2} = \frac{dz}{-z^2}$
- d) None of these

4. What is the general solution of the given partial differential equation?  $xp + yq = z$ .

- a)  $\phi\left(\frac{x+1}{y}, \frac{y}{z}\right) = 0$
- b)  $\phi\left(\frac{x^y}{z}, \frac{y}{z}\right) = 0$
- c)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$
- d)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

5. What is the complementary function of the given equation?  $(DD' + aD + bD' + ab)Z = e^{mx+ny}$

- a)  $e^{-by}\phi_1 y + e^{-ax}\phi_2 y$
- b)  $e^{-bx}\phi_1 y + e^{-ay}\phi_2 x$
- c)  $\phi_1 y + \phi_2 x$
- d) None of these

6. The solution of the given equation is  $(D^2 + 3DD' + 2D'^2)Z = x + y$

- a)  $Z = \phi_1 y - x + \phi_2 y - 2x + \frac{1}{36}x + y^3$
- b)  $Z = \phi_1 y + x + \frac{1}{36}x + y^3$
- c)  $Z = x + e^y \phi_1 y + e^x \phi_2 y$
- d) None of these

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7. What is the p

- a)  $\frac{e^{3x-2y}}{35}$
- b)  $e^{3y+x}$
- c)  $\frac{e^{3x+2y}}{35}$
- d) None

8. What is the p

- a) 2
- b) 1
- c) 0
- d) -1

9. For the

- a)  $\pi$
- b)  $\pi$
- c)  $\pi$
- d)  $\pi$

10. If t

- a)  $\pi$
- b)  $\pi$
- c)  $\pi$
- d)  $\pi$

11. If t

12

7. What is the particular integral of the given equation?

$$D^2 - 4DD' + D - 1)Z = e^{3x-2y}$$

- a)  $\frac{e^{3x-2y}}{35}$
- b)  $e^{3y+x}$
- c)  $\frac{e^{3x+2y}}{35}$
- d) None of these

8. What is the order of the given equation?

$$\tan y \frac{\partial z}{\partial x} + \tan x \frac{\partial z}{\partial y} = \sec^2 z.$$

- a) 2
- b) 1
- c) 0
- d) -1

9. For the maximum Compton Shift, the scattering angle ( $\phi$ ) should be

- a)  $\pi$
- b)  $2\pi$
- c)  $\pi/2$
- d) 0

10. If the temperature increases, then Wien's Displacement Law states

- a) That the wavelength of thermal radiations increases
- b) That the wavelength of thermal radiations decreases
- c) That the wavelength of thermal radiations remains the same
- d) None of the above

11. According to Heisenberg's uncertainty principle,

- a) An electron can reside inside the nucleus in any state
- b) An electron can reside inside the nucleus in a stationary state
- c) An electron cannot reside inside the nucleus
- d) None of the above

12. If we plot the log of power radiated by the black body versus the log of temperature, the slope of the line should be

- a) 2
- b) Infinite
- c) Not defined
- d) 4

13. The thermodynamic probability ( $\Omega$ ) is related to entropy ( $S$ ) as  
( $K$  is Boltzmann Constant)

- a)  $S = K \ln \Omega$
- b)  $\Omega = K \ln S$
- c)  $K = S \ln \Omega$
- d)  $K = \Omega \ln S$

14. The ultraviolet catastrophe occurs at
- a) Medium frequencies
  - b) Higher wavelengths
  - c) Medium wavelengths
  - d) Higher frequencies
15. A blackbody radiates energy at
- a) Lower frequencies
  - b) Higher frequencies
  - c) All frequencies
  - d) A blackbody does not radiate any energy
16. The Ray-Leigh Jeans law fails at
- a) Lower wavelengths
  - b) Higher wavelengths
  - c) Lower frequencies
  - d) All frequencies
17. Which type of hybridisation is possible in square planar molecules?
- a)  $sp^3d$
  - b)  $dsp^3$
  - c)  $dsp^2$
  - d)  $sp^3d^2$
18. The compound having pentagonal bi-pyramidal geometry with two types of bond angle is
- a)  $BrF_5$
  - b)  $ClF_5$
  - c)  $IF_7$
  - d)  $ClF_3$
19. Polymer that changes reversibly into hard and rigid materials on heating and cannot be reshaped once it sets: is
- a) Thermoplastics
  - b) Fibres
  - c) Thermosetting plastics
  - d) Elastomers
20. Rubber can be vulcanised to improve its properties by heating it with
- a) Sulphur
  - b) Carbon powder
  - c) Silica
  - d) Alumina
21. Which of the following compounds will not exhibit NMR spectroscopy?
- a)  $^1H^1$
  - b)  $^{12}C^{12}$
  - c)  $^{13}C^{13}$
  - d)  $^{19}F^{19}$
22. The number of signals obtained in the NMR spectra of tetramethyl silane,  $Si(CH_3)_4$  are
- a) 1

23. The  
a) 2  
b) 3  
c) 4  
d) 5

24. The  
a) 1  
b) 2  
c) 3  
d) 4

25. 1  
a) 1  
b) 2  
c) 3  
d) 4

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- b) 2
- c) 3
- d) 4

23. The type of lubrication under conditions of slow speed and high load is

- a) Thick film or hydrodynamic lubrication
- b) ~~Thin film or boundary lubrication~~
- c) High-pressure lubrication
- d) All the above

24. The type of lubricant used under the conditions of high temperature and high pressure is

- a) Liquid lubricants
- b) Semi-solid lubricants
- c) ~~Solid lubricants~~
- d) All the above

25. Which of the following is not a metric thread?

- a) ~~BSW thread~~
- b) V thread
- c) American thread
- d) Unified thread

26. Square threads are preferably used for

- a) ~~Power transmission~~
- b) Clamping devices
- c) Easy operation of engagement and disengagement
- d) Fastening purpose

27. If the surface contours are complicated then

- a) Auxiliary view for each surface is drawn single or double
- b) Auxiliary view is drawn on single view
- c) ~~The top view is omitted and auxiliary view is drawn by transferring dimension~~
- d) Auxiliary view for each surface can be drawn separately

28. Crane hook is drawn by which of the following method.

- a) Full section
- b) Half section
- c) Removed section
- d) ~~Revolved section~~

29. The section which cuts the object at an angle is called

- a) Removed section
- b) Broken out section
- c) ~~Auxiliary section~~
- d) Assembly section

30. The drawing in which we use the two vanishing points, the view is called

- a) Parallel perspective view
- b) Perpendicular perspective view
- c) Angular perspective view
- d) ~~Perspective view~~

31. From which of the following view we get the piercing point \_\_\_\_\_

- a) Perspective view  
b) Side view  
 c) Top view  
d) Front view

32. Double row roller Bearing is used \_\_\_\_\_

- a) To take axial load  
b) To take radial load  
c) To take heavy axial load  
 d) To take heavy radial load

33. Resistivity of a wire depends on

- a) Length  
 b) Material  
c) Cross section area  
d) None of the above

34. Kirchhoff's voltage law is based on law of conservation of

- a) Charge  
 b) Energy  
c) Momentum  
d) None

35. Two bulbs marked 200 watt-250 volts and 100 watt-250 volts are joined in series to 250 volts supply. Power consumed in circuit is

- a) 33 watt  
 b) 67 watt  
c) 100 watt  
d) 300 watt

36. We have three resistances of values 2  $\Omega$ , 3  $\Omega$  and 6  $\Omega$ . Which of the following combination will give an effective resistance of 4  $\Omega$ ?

- a) All the three resistances in parallel  
 b) 2  $\Omega$  resistance in series with parallel combination of 3  $\Omega$  and 6  $\Omega$  resistance  
c) 3  $\Omega$  resistance in series with parallel combination of 2  $\Omega$  and 6  $\Omega$  resistance  
d) 6  $\Omega$  resistance in series with parallel combination of 2  $\Omega$  and 3  $\Omega$  resistance

37. The ratio of the resistance of a 100 W, 220 V lamp to that of a 100 W, 110 V lamp will be nearly

- a) 4  
b) 2  
c) 1/2  
d) 1/4

38. The peak value of a sine wave is 200 V. Its RMS value is

- a) 127.4 V  
 b) 141.4 V  
c) 100 V  
d) 200 V

39. The phase difference between the voltage and current in a pure inductive circuit is

- a)  $90^\circ$   
b)  $180^\circ$   
c)  $0^\circ$   
d)  $45^\circ$

40. Three resistors of 10  $\Omega$ , 20  $\Omega$  and 30  $\Omega$  are connected in parallel. The equivalent resistance is

- a) 30  $\Omega$   
b) 3  $\Omega$   
 c) 2  $\Omega$   
d) 4  $\Omega$

41. When a resistor is connected in parallel with a battery, the current through the resistor is

- a) C  
 b) C  
c) E  
d) C

42. An inductor of inductance L is connected in series with a resistor of resistance R. The circuit is connected to an AC source of voltage V and frequency f. The power factor of the circuit is

- a) 1  
b)  $\frac{R}{\sqrt{R^2 + \omega^2 L^2}}$   
 c)  $\frac{\omega L}{\sqrt{R^2 + \omega^2 L^2}}$   
d)  $\frac{R}{\omega L}$

43. The current through a resistor of resistance R is given by  $i = I_0 \sin \omega t$ . The average power dissipated in the resistor is

- a)  $I_0^2 R$   
 b)  $\frac{1}{2} I_0^2 R$   
c)  $\frac{1}{2} I_0 R$   
d)  $I_0 R$

44. A resistor of resistance R is connected in series with a capacitor of capacitance C. The circuit is connected to an AC source of voltage V and frequency f. The power factor of the circuit is

- a)  $\frac{R}{\sqrt{R^2 + \frac{1}{\omega^2 C^2}}}$   
 b)  $\frac{1}{\sqrt{1 + \frac{1}{\omega^2 C^2 R^2}}}$   
c)  $\frac{1}{\sqrt{1 + \frac{1}{\omega^2 C^2 R^2}}}$   
d)  $\frac{1}{\sqrt{1 + \frac{1}{\omega^2 C^2 R^2}}}$

45. A resistor of resistance R is connected in series with a capacitor of capacitance C. The circuit is connected to an AC source of voltage V and frequency f. The power factor of the circuit is

- a)  $\frac{R}{\sqrt{R^2 + \frac{1}{\omega^2 C^2}}}$   
 b)  $\frac{1}{\sqrt{1 + \frac{1}{\omega^2 C^2 R^2}}}$   
c)  $\frac{1}{\sqrt{1 + \frac{1}{\omega^2 C^2 R^2}}}$   
d)  $\frac{1}{\sqrt{1 + \frac{1}{\omega^2 C^2 R^2}}}$

46. The peak value of a sine wave is 200 V. Its RMS value is

- a) 141.4 V  
b) 100 V  
c) 200 V  
d) 127.4 V



25 100 100

39. The phase difference between voltage and current wave through a circuit element is given as  $30^\circ$ . The essential condition is that
- a) Both waves must have same frequency
  - b) Both waves must have identical peak values
  - c) Both waves must have zero value at the same time
  - d) None of the above
40. Three 3 ohm resistors are connected to form a triangle. What is the resistance between any two of the corners?
- a)  $3/4$  ohms
  - b) 3 ohms
  - c) 2 ohms
  - d)  $4/3$  ohms
41. When a pure semiconductor is heated, its resistance .....
- a) Goes up
  - b) Goes down
  - c) Remains the same
  - d) Can't say
42. An n-type semiconductor is .....
- a) Positively charged
  - b) Negatively charged
  - c) Electrically neutral
  - d) None of the above
43. The phase difference between the input and output voltages of a transistor connected in common emitter arrangement is .....
- a)  $0^\circ$
  - b)  $180^\circ$
  - c)  $90^\circ$
  - d)  $270^\circ$
44. A crystal diode has forward resistance of the order of .....
- a)  $k\Omega$
  - b)  $\Omega$
  - c)  $M\Omega$
  - d) None of the above
45. A zener diode is used as .....
- a) An amplifier
  - b) A voltage regulator
  - c) A rectifier
  - d) A multivibrator
46. The collector of a transistor is ..... doped
- a) Heavily
  - b) Moderately
  - c) Lightly
  - d) None of the above

47. In a transistor,  $I_c = 100$  mA and  $I_e = 100.2$  mA. The value of  $\beta$  is .....
- a) 100
  - b) 50
  - c) about 1
  - d) 200

48. The relation between  $\beta$  and  $\alpha$  is .....
- a)  $\beta = 1/(1 - \alpha)$
  - b)  $\beta = (1 - \alpha) / \alpha$
  - c)  $\beta = \alpha/(1 - \alpha)$
  - d)  $\beta = \alpha/(1 + \alpha)$

49. The language of zeroes and ones is known as
- a) Machine language
  - b) Assembly language
  - c) Pseudo language
  - d) Foreign language

Q50. SCSI stands for

- a) Serial computer system interface
- b) Synchronous computer system interface
- c) Server computer system interface
- d) Small computer system interface

51. Which of the following symbols represents the decision condition in a flowchart?

- a) Ellipse
- b) Rectangle
- c) Diamond
- d) Arrow

52. A collection of four bits is termed as a

- a) Word
- b) Byte
- c) Nibble
- d) Tuple

53. Google docs is a class of

- a) System software
- b) Application Software
- c) Malware
- d) Firmware

54. Which of the following cannot be a variable name in C language?

- a) super123
- b) 123super
- c) \_123super
- d) sln2p3er

55. In C language, a function which calls itself is called a

- a) Relation

- b) Inception
- c) Expression
- d) Recursion**

56. What should be the output of the following piece of code?  
void main()  
{  
  int a = 10/3;  
  printf("%d", a);  
}

- a) 3**
- b) 3.0
- c) 3.33
- d) 1

57. A copper bar is fixed at both ends. If the bar is heated, then the stress developed in the bar will be \_\_\_\_\_

- a) Compressive axial stress**
- b) Tensile axial stress
- c) Shear stress
- d) Zero

58. The figure shown below represents the Stress-Strain curve for mild steel. The point 'E' in the curve represents \_\_\_\_\_?



- ~~a) Upper Yield Point~~
- ~~b) Lower Yield Point~~
- c) Ultimate stress**
- ~~d) Rupture point~~

59. A steel bar of 30 mm × 30 mm square cross-section is subjected to an axial tensile load of 350 kN. If the length of the bar is 2.5 m and E = 250 GPa, the elongation of the bar will be

- ~~a) 3.9 mm~~
- ~~b) 3.7 mm~~
- c) 3.5 mm**
- d) 3.3 mm

60. Poisson's ratio is the ratio of \_\_\_\_\_

- a) Longitudinal strain to transverse strain
- b) Shear strain to longitudinal strain
- c) Lateral strain to longitudinal strain**
- d) Transverse strain to shear strain

# ENTRANCE TEST-2023

## School of Engineering

### B.Tech/BE Lateral Entry

Total Questions  
Time Allowed

: 60  
: 70 Minutes

Roll No.

--	--	--	--	--	--

1. Write your roll number in the space provided at the top of this page of question booklet and fill up the necessary information in the spaces provided on OMR Answer sheet.
2. OMR Answer sheet has an original copy and a candidate's copy glued beneath it at the top. While making entries in the original copy, candidate should ensure that the two copies are aligned properly so that the entries made in the original copy against each item are exactly copied in the candidate's copy.
3. All entries in the OMR answers sheet including answers to questions are to be recorded in the original/Carbon copy.
4. Use only blue/ black ball point pen to darken the circle of correct / most appropriate response. In no case gel/ ink pen or pencil should be used.
5. Do not darken more the one circle of option for any question. A question with more than darkened response shall be considered wrong.
6. There will be negative marking for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
7. Only those candidates who would obtain positive score in entrance test examination shall be eligible for admission.
8. Do not make any stray mark on the OMR sheet.
9. Calculators and mobiles shall not be permitted inside the examination hall.
10. Rough work, if any, should be done on the blank sheets provided with the question booklet.
11. OMR answer sheet must be handled carefully and it should not be folded or mutilated in such case it will not be evaluated.
12. Ensure that your OMR Answer sheet has been signed by the invigilator and the candidate himself/herself.
13. At the end of the examination hand over the OMR answer sheet to the invigilator who will then tear off the original OMR sheet in presence of the candidate and hand over the candidate's copy to the candidate.
14. If any of the information in the response Sheet/Question Paper has been found missing or not mentioned as stated above the candidate is solely responsible for that lapse.

- Q1) The solution of the differential equation  $a(p + q) = z$  is
- a)  $\phi(x - y, y - az) = 0$
  - b)  $\phi(x + y, y + az) = 0$
  - c)  $\phi(x - y, y + az) = 0$
  - d)  $\phi(x + y, y - az) = 0$

- Q2) The solution of the differential equation  $(D^2 + a^2)y = 0$  is
- a)  $c_1 \cos ax + c_2 \sin ax$
  - b)  $c_1 \cos ax - c_2 \sin ax$
  - c)  $(c_1 + c_2 x) \sin ax$
  - d)  $(c_1 + c_2 x) \cos ax$

- Q3) The Particular integral of the differential equation  $(D^2 + 1)y = \cos 2x$  is
- a)  $\frac{1}{3} \sin 2x$
  - b)  $-\frac{1}{3} \sin 2x$
  - c)  $-\frac{1}{3} \cos 2x$
  - d)  $\frac{1}{3} \cos 2x$

- Q4) The solution of the differential equation  $(x^2 D^2 - xD + 2)y = 0$  is
- a)  $x(c_1 \cos(\log x) - c_2 \sin(\log x))$
  - b)  $x(c_1 \cos(\log x) + c_2 \sin(\log x))$
  - c)  $(c_1 \cos(\log x) - c_2 \sin(\log x))$
  - d)  $(c_1 \cos(\log x) + c_2 \sin(\log x))$

- Q5) The Frobenius method can be used about a point  $x = a$  if
- a)  $x = a$  is a regular point
  - b)  $x = a$  is an irregular point
  - c) both a and b
  - d) None of these

- Q6) The differential equation  $x^2 y'' + xy' + (x^2 - n^2)y = 0$  where  $2n$  is non integral is known as
- a) Hermit's Equation
  - b) Legendre's Equation
  - c) Bessel's Equation
  - d) None of the above

- Q7) The most general solution of the wave equation is
- a)  $y = (AC \cos \sqrt{kt} + B \sin \sqrt{kt})(CC \cos \sqrt{kx} + D \sin \sqrt{kx})$
  - b)  $y = (AC \cos \sqrt{kt} + B \sin \sqrt{kt}) + (CC \cos \sqrt{kx} + D \sin \sqrt{kx})$
  - c)  $y = (AC \cos \sqrt{kt} - B \sin \sqrt{kt})(CC \cos \sqrt{kx} + D \sin \sqrt{kx})$
  - d) None of the above

- Q8) The p...  
a) ...  
b) ...  
c) ...  
d) ...

- Q9) The v...  
a) ...  
b) ...  
c) ...  
d) ...

- Q10) If ...  
a) ...  
b) ...  
c) ...  
d) ...

- Q11) A p...  
a) ...  
b) ...  
c) ...  
d) ...

- Q12) If ...  
a) ...  
b) ...  
c) ...  
d) ...

- Q13) W...  
a) ...  
b) ...  
c) ...  
d) ...

- Q14) Ass...  
a) ...  
b) ...  
c) ...  
d) ...

Q8) The partial differential equation  $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$  represents

- a) one dimensional wave equation
- b) one dimensional heat equation
- c) two dimensional wave equation
- d) two dimensional heat equation

Q9) The value of probability of an event cannot be

- a) 0
- b) 1
- c) 0.5
- d) Negative

Q10) If 4 distinguishable particles are arranged in 2 compartments, then the thermodynamic probability for the macrostate (3, 1) is

- a) 4
- b) 6
- c) 8
- d) 10

Q11) A photon recoils back after striking an electron at rest. What is the change in wavelength of the photon?

- a) 2.2 Å
- b) 4.0 Å
- c) 0.0486 Å
- d) No change

Q12) If the uncertainty in the location of the particle is equal to its De-Broglie wavelength, what is the uncertainty with velocity?

- a) h
- b) v
- c) mv
- d) None of the above

Q13) Wein's displacement law is a special case of

- a) Planck's law
- b) Newton's law
- c) Kirchoff's law
- d) None of the above

Q14) Assuming MB-distribution of molecular speeds, the most probable speed is given by

- a)  $\sqrt{\frac{2kT}{m}}$
- b)  $\sqrt{\frac{4kT}{m}}$
- c)  $\sqrt{\frac{3kT}{m}}$
- d)  $\sqrt{\frac{8kT}{\pi m}}$

Q15) Zero-point energy of one-dimensional quantum mechanical harmonic oscillator is

- a) 0
- b)  $h\omega$
- c)  $0.5h\omega$
- d)  $2h\omega$

Q16) In black body spectrum, the Rayleigh-Jeans law agrees with experimental results

- a) At low frequencies
- b) At higher frequencies
- c) At low wavelengths
- d) None of the above

|  $\propto$

Q17) The correct sequence of bond order among the following oxygen species is:

- a)  $O_2^- > O_2^+ > O_2^{2-} > O_2$
- b)  $O_2^+ > O_2 > O_2^- > O_2^{2-}$
- c)  $O_2 > O_2^{2-} > O_2^- > O_2^+$
- d)  $O_2^{2-} > O_2 > O_2^+ > O_2^-$

Q18) The compound having pentagonal bipyramidal geometry with two types of bond angle is

- a)  $BrF_5$
- b)  $ClF_3$
- c)  $IF_7$
- d)  $ClF_5$

✓

Q19) A polymer made up of more than one type of monomer units is termed as

- a) Homopolymer
- b) Copolymer
- c) Homochain polymer
- d) Heterochain polymer

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Q20) Polymer that changes into hard and rigid materials on heating and cannot be reshaped once it sets is called

- a) Thermoplastics
- b) Fibres
- c) Thermosetting plastics
- d) Elastomers

2

Q21) Which of the following elements will exhibit NMR spectroscopy?

- a)  $^{12}C_6$
- b)  $^{16}O_8$
- c)  $^{13}C_6$
- d)  $^{32}S_{16}$

Q22) A covalently bonded group that shows a characteristic absorption in the ultraviolet or the visible region is called as

- a) Chromophore
- b) Auxochrome
- c) Saturated group
- d) Polar group

- Q23) The type of lubrication under conditions of slow speed and high load is
- a) Thick film or hydrodynamic lubrication
  - b) Thin film or boundary lubrication
  - c) High-pressure lubrication
  - d) All the above

- Q24) A good lubricant must have
- a) High viscosity and low viscosity index
  - b) Low viscosity and high viscosity index
  - c) Moderate viscosity and low viscosity index
  - d) Moderate viscosity and high viscosity index

- Q25) What is the SI unit of electric current?
- a) Volts (V)
  - b) Watts (W)
  - c) Amperes (A)
  - d) Ohms ( $\Omega$ )

- Q26) A resistor has a resistance of 150 ohms. If a current of 0.5 amperes flows through it, what is the voltage across the resistor?
- a) 75 V
  - b) 75 A
  - c) 300 V
  - d) 300 A

- Q27) Which of the following statements is true about parallel combination of resistors?
- a) The total resistance is the sum of individual resistances.
  - b) The total resistance is the product of individual resistances.
  - c) The total resistance is always smaller than the smallest individual resistance.
  - d) The total resistance is always larger than the largest individual resistance.

- Q28) An electric appliance at unity power factor consumes 500 watts of power when connected to a 100-volt source. What is the current flowing through the appliance?
- a) 5 A
  - b) 50 A
  - c) 500 A
  - d) 0.5 A

- Q29) According to Ohm's Law, the relationship between voltage (V), current (I), and resistance (R) is given by:
- a)  $V = I/R$
  - b)  $I = V/R$
  - c)  $R = V/I$
  - d)  $V = RI$



Q30) Two resistors with resistances of 4 ohms and 6 ohms are connected in series. What is the total resistance of the combination?

- a) 2 ohms
- b) 10 ohms
- c) 24 ohms
- d) 46 ohms

Q31) Which of the following statements is correct regarding Kirchoff's Current Law (KCL)?

- a) The algebraic sum of currents at any node is zero.
- b) The algebraic sum of currents in any closed loop is zero.
- c) The algebraic sum of voltages in any closed loop is zero.
- d) The algebraic sum of voltages at any node is zero.

Q32) A circuit contains a 12-volt battery, a 1-ohm resistor, and a 5-ohm resistor connected in series. What is the total current flowing through the circuit?

- a) 2 A
- b) 3 A
- c) 4 A
- d) 5 A

Q33) Which of the following statement is False?

- a) Compiler converts program written in High level language into Low level language.
- b) 'C' Language belongs to class of Structural/procedural language category.
- c) Windows and Linux are the examples of application software.
- d) Microsoft Word, Microsoft Excel are examples of application software.

Q34) Consider the following statements about computer memory:

- (I) USB Drive is an example of magnetic memory device and is a volatile memory.
- (II) RAM is an example of primary storage device and is a volatile memory.
- (III) Hard disk and CD-ROM are examples of secondary storage devices and belong to class of non-volatile memories.

Which of the above statements is TRUE?

- a) Only I is True
- b) Only II is True
- c) Both II and III are True
- d) All three statements are True

Q35) Which of the following statement about computer ports is True?

- a) USB stands for Universal Serial Bus and supports only single device at a time.
- b) VGA connector is a standard connector used for computer video output.
- c) HDMI stands for High Density Magnetic Interface and allows port to only send very low-resolution videos to other compatible devices.
- d) RJ-45 is not suitable for Ethernet networking.

Q36) Which of the following detailed steps related to the development of a program?

- a) C-Program
- b) ER diagram
- c) Program Flowchart
- d) Top Down development

Q37) What will be the output of the following program?

- a) 2
- b) 1
- c) 2,1
- d) None of the above

Q38) What will be the output of the following program?

```
#include <stdio.h>
int main()
{
    int a=10;
    while(a<1)
    {
        printf("hello\n");
        break;
    }
    printf("exit\n");
    return 0;
}
```

- a) hello
- b) hello
- c) exit
- d) None

Q36) Which of the following is a structured programming technique that graphically represents the detailed steps required to solve a computer problem?

- a) C-Program
- b) ER diagram
- c) Program Flowchart
- d) Top Down design diagram.

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Q37) What will be the output of the following C program?

```
#include <stdio.h>
int main ()
{
    int i=0, a=10, b=20;
    i=(a>b) ? 1 : 2;
    printf("%d", i);
    return 0;
}
```

- a) 2
- b) 1
- c) 2, 1
- d) None of the above

Q38) What will be the output of the following C program?

```
#include <stdio.h>
int main()
{
    int a=10;
    while(a<1)
    {
        printf("Hello");
        break;
    }
    printf("exit");
    return 0;
}
```

- a) hello exit
- b) hello hello exit
- c) exit
- d) None of the above

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Handwritten notes: A circled '7', '10T', a box containing '25', and '250'.

Q39) The C language keyword which is used to transfer control from a function back to the calling function is:

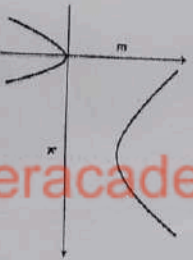
- a) main
- b) goto
- c) getch
- d) return

2

Q40) The magnitude of the current through a practical PN junction diode, which is subjected to a low reverse bias, is observed to increase slowly with the increase in applied voltage in the reverse direction. Which one of the following is the most possible reason for this non-ideal behavior?

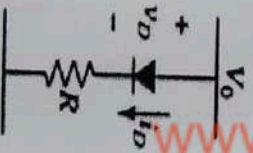
- a) Recombination of the electron-hole pairs in the depletion region.
- b) Impact of series resistance
- c) High level injection of minority carriers that surpass the background doping concentration.
- d) Generation of electron-hole pairs in the depletion region.

Q41) What can you infer about the semiconductor material from the given E-k diagram?



- a) It is a direct bandgap material with effective electron mass greater than hole mass.
- b) It is a direct bandgap material with effective electron mass lesser than hole mass.
- c) It is an indirect bandgap material with effective electron mass greater than hole mass.
- d) It is an indirect bandgap material with effective electron mass lesser than hole mass.

Q42) In the circuit below,  $V_0 = 2.02$  volts, and the resistor  $R = 0.9K\Omega$ . Assume a cut in voltage of  $0.65$  volts for the diode. Current  $I_D$  is ?



- a)  $1.82mA$
- b)  $1.37mA$
- c)  $1.52mA$
- d)  $1.67mA$

Q43) The emitter of a transistor is generally doped the heaviest because it

- a)
- b)
- c)
- d)

Q44) In

- a)
- b)
- c)
- d)

Q45) A

- a)
- b)
- c)
- d)

Q46) A

Q47

Q48

- a) Has to dissipate maximum power.
- b) Has to supply the change carriers.
- c) Is the first region of the transistor
- d) Must possess low resistance.

Q44) 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.

Q45) A device whose characteristics are very close to that of an ideal voltage source is

- a) BJT
- b) Resistor
- c) MOSFET
- d) Zener Diode

C

Q46) A BJT is said to be operating in the saturation region if

- a) Both the junctions are reverse biased
- b) Base-emitter junction is reverse biased and base-collector junction is forward biased
- c) Base emitter junction is forward biased and base-collector junction is reverse biased
- d) Both the junctions are forward biased

Q47) A maximum rectification efficiency of full wave rectifier is \_\_\_\_\_?

- a) 81.2%
- b) 0.2%
- c) 8.2%
- d) 90%

Q48) If a screw thread advances in the nut when turned in a clockwise direction, it is called \_\_\_\_\_?

- a) left hand helix
- b) right hand helix
- c) clockwise helix
- d) anticlockwise helix

Q49) Vice used for carpentry work has \_\_\_\_\_ thread.

- a) Square
- b) Buttress
- c) Acme
- d) Square

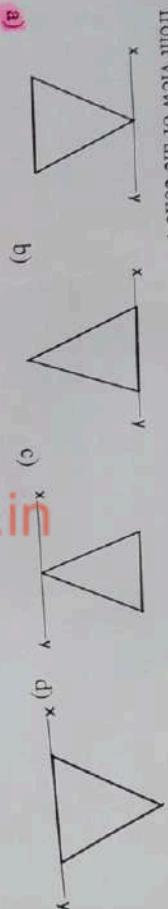
$\alpha$

Q50) To obtain parallel lines, concentric circles and parallel curves, \_\_\_\_\_ is used.

- a) Array
- b) Fillet
- c) Copy
- d) Offset

- Q51) A solid steel shaft is to transmit a torque of 10 kN-m. If the shear stress in the shaft is not to exceed 45 MPa, the minimum diameter of the shaft will be \_\_\_\_\_
- 92 mm
  - 104 mm**
  - 78 mm
  - 120 mm

Q52) A cone has its apex on the horizontal plane and the axis of the cone is parallel to the vertical plane. If the cone is in 'third quadrant', then which of the following represents the correct front view of the cone?



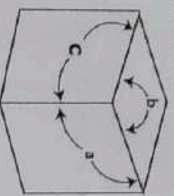
a)

b)

c)

d)

Q53) If the angles between the three axes are ' $a' = 100^\circ$ ', ' $b' = 160^\circ$ ' and ' $c' = 100^\circ$ ', then the cube shown below is drawn in which axonometric projection?



- Isometric
- Dimetric**
- Trimetric
- Orthographic

Q54) Shear stresses on mutually perpendicular planes are:

- Zero
- Equal**
- Maximum
- Minimum

Q55) Which of the following are functions of bearings?

- Ensure free rotation of shaft with minimum friction
- Holding shaft in a correct position
- Transmit the force of the shaft to the frame
- All of the listed**

Q56) Double row roller Bearings is used \_\_\_\_\_

- To take axial load
- To take radial load
- To take heavy axial load
- To take heavy radial load**

Q57) Bolt which consists of only a cylindrical shank threaded at both ends is called \_\_\_\_\_

- Headless
- Tap-bolt
- Stud-bolt**
- Counter

Q58) The ratio of \_\_\_\_\_ with an ad

- 1/3**
- 2/3
- 3/4
- 1/2

Q59) The Cha

- Tough**
- Creep
- Fatigue
- Elasticity

Q60) The pro

- Maxi
- Mini
- Zero**
- Nege

- a) Headless tapered bolt
- b) Tap-bolt or cap screw
- c) Stud-bolt or Stud
- d) Countersunk-headed bolt

Q58) The ratio of elongation of a prismatic bar due to its total self weight  $W$  to that of a similar bar with an additional weight  $W$  attached at its free end is:

- a)  $1/3$
- b)  $2/3$
- c)  $3/4$
- d)  $1/4$

Q59) The Charpy test is conducted to measure:

- a) Toughness
- b) Creep Strength
- c) Fatigue strength
- d) Elastic strength of a material

Q60) The product of inertia of a body about its axis of symmetry is:

- a) Maximum
- b) Minimum
- c) Zero
- d) Negative