MHT CET 2024 PCM May 10 Shift 2 Question Paper

Conducted by the State Common Entrance Test Cell, Maharashtra

Time Allowed: 180 Minutes **Total Questions: 150** **Maximum Marks: 200**

General Instructions

(i) This **PCM** paper is from **MHT CET 2024**, conducted by the **State Common Entrance Test Cell, Maharashtra**.

(ii) Answer all **150 multiple choice questions**: **50 Physics**, **50 Chemistry** and **50 Mathematics**.

(iii) Each question offers **four choices**, with **one correct answer**.

(iv) Allow **90 minutes for Physics and Chemistry together**, followed by **90 minutes for Mathematics**. The first group closes before the second opens.

(v) Correct answers earn **1 mark in Physics and Chemistry** and **2 marks in Mathematics**.

(vi) There is **no negative marking**. Unanswered questions score zero.

1. In semiconductors at room temperature,

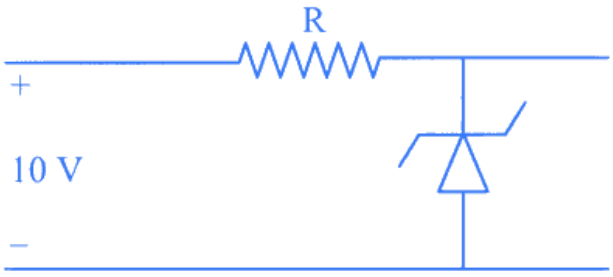
(A) the valence band is completely filled and the conduction band partially filled.

(B) the valence band is completely filled.

(C) the conduction band is completely filled.

(D) the valence band is partially empty and the conduction band partially filled.

2. In the given circuit, Zener breakdown voltage is 8 V . If power of Zener diode is 1.6 W . The value of R is



(A) 2 Ω

(B) 4 Ω

(C) 6 Ω

(D) 10 Ω

3. An a.c. voltage source $V = V_0 \sin \omega t$ is connected across resistance ' R ' and capacitance ' C ' in series. It is given that $R = \frac{1}{\omega c}$ and the peak current is I_0. If the angular frequency of the voltage source is changed to $\left(\frac{\omega}{\sqrt{3}}\right)$, then the new peak current in the circuit is

(A) $\frac{I_0}{2}$

(B) $\frac{I_0}{\sqrt{2}}$

(C) $\sqrt{2}I_0$

(D) $\sqrt{3}I_0$

4. The black discs x, y and z have radii 1 m, 2 m and 3 m respectively. The wavelengths corresponding to maximum intensity are 200 nm, 300 nm and 400 nm respectively. The relation between emissive power E_x, E_y and E_z is

(A) $E_x > E_y > E_z$

(B) $E_x < E_y < E_z$

(C) $E_x = E_y = E_z$

(D) $E_y > E_x < E_z$

5. The height ' h ' from the surface of the earth at which the value of ' g ' will be reduced by 64% than the value at surface of the earth is (R = radius of the earth)

(A) $\frac{1}{3}R$

(B) $\frac{2}{3}R$

(C) $\frac{3}{2}R$

(D) 2R

6. The length of a sonometer wire 'AB' is 110 cm . Where should the two bridges be placed from end ' A ' to divide the wire in three segments whose fundamental frequencies are in the ratio 1 : 2 : 3 ?

(A) 60 cm and 90 cm

(B) 90 cm and 100 cm

(C) 40 cm and 80 cm

(D) 50 cm and 90 cm

7. If a unit charge is taken from one point to another point over an equipotential surface, then

(A) work is done on the charge.

(B) work is done by the charge.

(C) work done on the charge is constantly increasing.

(D) work done to move a charge is zero.

8. Two soap bubbles having radii ' r_1 ' and ' r_2 ' has inside pressure ' P_1 ' and ' P_2 ' respectively. If P_0 is external pressure then ratio of their volume is

(A) $\frac{(P_1-P_0)}{(P_2-P_0)}$

(B) $\frac{(P_2-P_0)}{(P_1-P_0)}$

(C) $\frac{(P_2-P_0)^3}{(P_1-P_0)^3}$

(D) $\frac{(P_1-P_0)^3}{(P_2-P_0)^3}$

9. A transformer has 120 turns in the primary coil and carries 5 A current. Input power is one kilowatt. To have 560 V output, the number of turns in secondary coil will be

(A) 168

(B) 200

(C) 336

(D) 400

10. A vehicle runs on a straight road of length 'L'. It travels half the distance with speed V and the remaining distance with speed $\frac{V}{3}$. Its average speed is

(A) $\frac{3V}{2}$

(B) V

(C) $\frac{V}{2}$

(D) $\frac{2V}{3}$

11. A particle of mass ' m ' performs uniform circular motion of radius ' r ' with linear speed ' v ' under the application of force ' F '. If ' m ', ' v ' and ' r ' are all increased by 20% the necessary change in force required to maintain the particle in uniform circular motion, is

(A) 12%
(B) 44%
(C) 14%
(D) 144%

12. In Young's double slit experiment, the distance between the two coherent sources is ' d ' and the distance between the source and screen is ' D '. When the wavelength (λ) of light source used is $\frac{d^2}{3D}$, then n^{th} dark fringe is observed on the screen, exactly in front of one of the slits. The value of ' n ' is

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

13. A particle starts oscillating simple harmonically from its equilibrium position with time period ' T '. What is the ratio of potential energy to kinetic energy of the particle at time $t = \frac{T}{12}$?

$$\left(\sin\left(\frac{\pi}{6}\right) = \frac{1}{2}\right)$$

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

14. A convex lens of focal length 40 cm is in contact with a concave lens of focal length 25 cm. The power of combination is

(A) -1.5D
(B) -6.5D
(C) $+6.5$D
(D) $+1.5$D

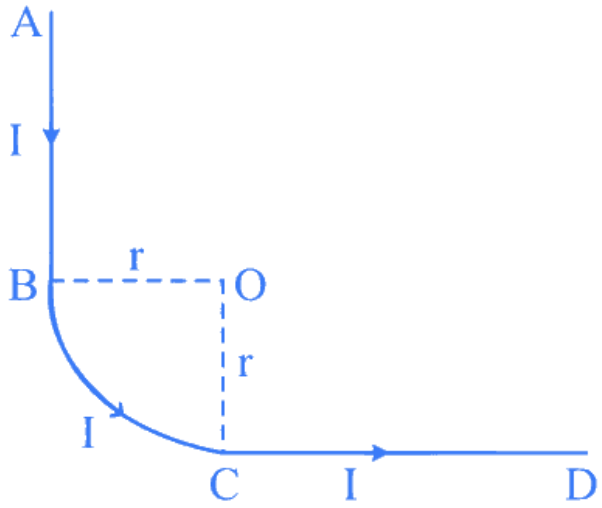
15. A particle performs linear S.H.M. When the displacement of the particle from mean position is 3 cm and 4 cm , corresponding velocities are 8 cm/s and 6 cm/s respectively. Its periodic time is

(A) 2π s
(B) πs
(C) 3π s
(D) 4π s

16. A photoelectric surface is illuminated successively by monochromatic light of wavelength ' λ ' and $\left(\frac{\lambda}{2}\right)$. If the maximum kinetic energy of the emitted photoelectrons in the first case is one-fourth that in the second case, the work function of the surface of the material is (c = speed of light, h = Planck's constant)

(A) $\frac{2hc}{\lambda}$
(B) $\frac{hc}{\lambda}$
(C) $\frac{2hc}{3\lambda}$
(D) $\frac{hc}{3\lambda}$

17. The magnitude of magnetic field at point 'O' in the following figure will be



(A) $\frac{\mu_0}{4\pi}\frac{I}{r}\left(\frac{2}{\pi}+2\right)$
(B) $\frac{\mu_0}{4\pi}\frac{I}{r}\left(\frac{2}{\pi}-2\right)$
(C) $\frac{\mu_0}{4\pi}\frac{I}{r}\left(2+\frac{\pi}{2}\right)$
(D) $\frac{\mu_0}{4\pi}\frac{I}{r}\left(2-\frac{\pi}{2}\right)$

18. Radius of first orbit in H -atom is ' a_0 ' Then, de-Broglie wavelength of electron in the third orbit is

(A) $3\pi a_0$
(B) $6\pi a_0$
(C) $9\pi a_0$
(D) $12\pi a_0$

19. For a gas, $\frac{R}{C_v} = 0.4$ where R is the universal gas constant and ' C_V ' is molar specific heat at constant volume. The gas is made up of molecules which are

(A) rigid diatomic.
(B) monoatomic.
(C) non-rigid diatomic.
(D) polyatomic.

20. Which one of the following is 'NOT' a contact force?

(A) Force of friction.
(B) Normal reaction.
(C) Gravitational force.
(D) Viscous force.

21. In a thermodynamic system ' ΔU ' represents the increase in internal energy and ' W ' the work done by the system. Which of the following statement is true?

(A) $\Delta U = -W$ in an adiabatic process.
(B) $\Delta U = W$ in an isothermal process.
(C) $\Delta U = -W$ in an isothermal process.
(D) $\Delta U = W$ in an adiabatic process.

22. If current of 4 A produces magnetic flux of 3×10^{-3} Wb through a coil of 400 turns, the energy stored in the coil will be

(A) 1.2 J (B) 2.4 J
(C) 24 J (D) 240 J

23. Two bodies A and B have their moments of inertia I_1 and I_2 respectively about their axis of rotation. If their kinetic energies of rotation are equal and their angular momenta L_1 and L_2 respectively are in the ratio $1 : \sqrt{3}$, then I_2 will be

(A) $\frac{1}{3}I_1$ (B) $\sqrt{3}I_1$
(C) $2I_1$ (D) $3I_1$

24. A body starts from rest from a distance R_0 from the centre of the earth. The velocity acquired by the body when it reaches the surface of the earth will be (R = radius of earth, M = mass of earth)

(A) $2GM(\frac{1}{R} - \frac{1}{R_0})$ (B) $\sqrt{2GM(\frac{1}{R} - \frac{1}{R_0})}$
(C) $GM(\frac{1}{R} - \frac{1}{R_0})$ (D) $2GM\sqrt{(\frac{1}{R} - \frac{1}{R_0})}$

25. Two metal spheres are falling through a liquid of density 2.5×10^3 kg/m^3 with the same uniform speed. The density of material of first sphere and second sphere is 11.5×10^3 kg/m^3 and 8.5×10^3 kg/m^3 respectively. The ratio of the radius of first sphere to that of second sphere is

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

26. In series LCR circuit, 'R' represents resistance of electric bulb. If the frequency of a.c. supply is doubled, the value of inductance ' L ' and capacitance 'C' should be

(A) both doubled. (B) made four times.
(C) made eight times. (D) both halved simultaneously.

27. Two point charges $q_1 = 6\mu C$ and $q_2 = 4\mu C$ are kept at points A and B in air where $AB = 10$ cm. What is the increase in potential energy of the system when q_2 is moved towards q_1 by 2 cm ?

$$\left(\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \text{ SI units}\right)$$

(A) 0.27 J (B) 0.54 J
(C) 0.81 J (D) 54 J

28. Two light rays having the same wavelength ' λ ' in vacuum are in phase initially. Then, the first ray travels a path ' L_1 ' through a medium of refractive index ' μ_1 ' while the second ray travels a path of length ' L_2 ' through a medium of refractive index ' μ_2 '. The two waves are then combined to observe interference. The phase difference between the two waves is

(A) $\frac{2\pi}{\lambda}(\mu_1 L_1 - \mu_2 L_2)$ (B) $\frac{2\pi}{\lambda}(L_2 - L_1)$
(C) $\frac{2\pi}{\lambda}(\frac{L_1}{\mu_1} - \frac{L_2}{\mu_2})$ (D) $\frac{2\pi}{\lambda}(\mu_2 L_1 - \mu_1 L_2)$

29. Prong of a vibrating tuning fork is in contact with water surface. It produces concentric circular waves on the surface of water. The distance between five consecutive crests is 0.8 m and the velocity of wave on the water surface is 56 m/s. The frequency of tuning fork is

(A) 256 Hz (B) 280 Hz
(C) 341 Hz (D) 512 Hz

30. Rate of radiation by a black body is ' R ' at temperature 'T'. Another body has same area but emissivity is 0.2 and temperature 3T. Its rate of radiation is

(A) $(162)R$ (B) $(81)R$
(C) $(16.2)R$ (D) $(8.1)R$

31. The end correction for the vibrations of air column in a tube of circular cross-section will be more if the tube is

(A) reduced in length. (B) increased in length.
(C) made thinner. (D) widened.

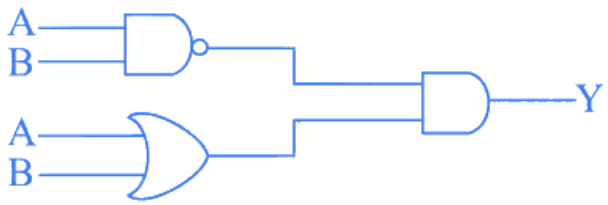
32. The potential difference $(V_A - V_B)$ between the points ' A ' and ' B ' in the given part of the circuit is



(A) -3 V (B) 3 V
(C) 6 V (D) 9 V

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33. The logic gate represented by following logic circuit is



(A) OR gate (B) AND gate
(C) NOR gate (D) X-OR gate

34. A coil of ' n ' turns and radius ' R ' carries a current 'I'. It is unwound and rewound to make a new coil of radius $\frac{R}{3}$ and the same current is passed through it. The ratio of the magnetic moment of the new coil to that of the original coil is

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

35. A particle rotates in a horizontal circle of radius 'R' in a conical funnel with constant speed 'V'. The inner surface of the funnel is smooth. The height of the plane of the circle from the vertex of the funnel is (g-acceleration due to gravity)

(A) $\frac{V}{g}$ (B) $\frac{\mathrm{V}}{2\,\mathrm{g}}$
(C) $\frac{\mathrm{V}^2}{2\,\mathrm{g}}$ (D) $\frac{\mathrm{V}^2}{\mathrm{g}}$

36. Two point charges (A and B) $+4q$ and $-4q$ are placed along a line separated by a distance I '. Force acting between them is F. If 25% of charge from point A is transferred to that at point B , the force between the charges now becomes

(A) $\frac{3}{4}$ F (B) $\frac{4}{3}$ F
(C) $\frac{9}{16}$ F (D) $\frac{16}{9}$ F

37. In Young's double slit experiment, the slits are separated by 0.6 mm and screen is placed at a distance of 1.2 m from slit. It is observed that the tenth bright fringe is at a distance of 8.85 mm from the third dark fringe on the same side. The wavelength of light used is

(A) 5440 $\overset{o}{A}$ (B) 5890 $\overset{o}{A}$
(C) 5900 $\overset{o}{A}$ (D) 6630 $\overset{o}{A}$

38. A charged particle is moving in a uniform magnetic field in a circular path of radius ' R '. When the kinetic energy of the particle is increased to three times, then the new radius will be

(A) $\frac{\mathrm{R}}{3}$ (B) $\frac{\mathrm{R}}{\sqrt{3}}$
(C) $\sqrt{3}\cdot\mathrm{R}$ (D) $3\cdot\mathrm{R}$

39. In the Bohr model of hydrogen atom, the centripetal force is furnished by the coulomb attraction between the proton and the electron. If ' r_0 ' is the radius of the ground state orbit, ' m ' is the mass, ' e ' is the charge on the electron and ' ε_0 ' is the permittivity of vacuum, the speed of the electron is

(A) zero (B) $\frac{\mathrm{e}}{\sqrt{\epsilon_0 \mathrm{r}_0\,\mathrm{m}}}$
(C) $\frac{\mathrm{e}}{\sqrt{4\pi\epsilon_0 \mathrm{r}_0\,\mathrm{m}}}$ (D) $\frac{\sqrt{4\pi\epsilon_0 \mathrm{r}_0\,\mathrm{m}}}{\mathrm{e}}$

40. A Carnot's cycle operating between $T_H = 600\,\mathrm{K}$ and $T_c = 300\,\mathrm{K}$ produces 1.5 kJ of mechanical work per cycle. The heat transferred to the engine by the reservoir is

(A) 2.5 kJ (B) 3.0 kJ
(C) 3.5 kJ (D) 4.0 kJ

41. Two concentric circular coils having radii ' r_1' and ' r_2 ' ($r_2 \ll r_1$) are placed co-axially with centres coinciding. The mutual inductance of the arrangement is (μ_0 = permeability of free space) (Both coils have single turn)

(A) $\frac{\mu_0 \pi r_2}{2r_1}$ (B) $\frac{\mu_0 \pi}{2r_1 r_2}$
(C) $\frac{\mu_0 \pi r_1}{2r_2}$ (D) $\frac{\mu_0 \pi r_2^2}{2r_1}$

42. An ordinary body cools from ' $4\theta'$ ' to ' $3\theta'$ ' in ' t ' minutes. The temperature of that body after next 't' minutes is (Assume Newton's law of cooling and room temperature is θ)

(A) $\frac{9\theta}{4}$ (B) $\frac{2\theta}{5}$
(C) $\frac{5\theta}{3}$ (D) $\frac{7\theta}{3}$

43. Stationary wave is produced along the stretched string of length 80 cm . The resonant frequencies of string are 90 Hz, 150 Hz and 210 Hz . The speed of transverse wave in the string is

(A) 45 m/s (B) 75 m/s
(C) 48 m/s (D) 80 m/s

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44. For the series LCR circuit, $R = \frac{X_L}{2} = 2X_c$. The impedance of the circuit and the phase difference between V and I will be

(A) $\frac{\sqrt{5}}{2}R, \tan^{-1}(\frac{1}{2})$ (B) $\frac{\sqrt{13}}{2}R, \tan^{-1}(\frac{3}{2})$

(C) $\sqrt{5}R, \tan^{-1}(1)$ (D) $\sqrt{13}R, \tan^{-1}(2)$

45. In compound microscope, the focal length and the aperture of the objective used is respectively

(A) large and large (B) large and small.

(C) small and large. (D) small and small.

46. A glass capillary of radius 0.35 mm is inclined at 60° with the vertical in water. The height of the water column in the capillary is (surface tension of water $= 7 \times 10^{-2}$ N/m, acceleration due to gravity, $g = 10$ m/s^2, $\cos 0^\circ = 1, \cos 60^\circ = 0.5$)

(A) 6 cm (B) 8 cm

(C) 10 cm (D) 12 cm

47. When a photosensitive surface is irradiated by lights of wavelengths ' λ_1 ' and ' λ_2 ', kinetic energies of the emitted photoelectrons is ' E_1 ' and ' E_2 ' respectively. The work function of the photosensitive surface is

(A) $\frac{(E_2\lambda_2 - E_1\lambda_1)}{(\lambda_2 - \lambda_1)}$ (B) $\frac{(E_1\lambda_1 + E_2\lambda_2)}{(\lambda_2 - \lambda_1)}$

(C) $\frac{(E_1\lambda_1 - E_2\lambda_2)}{(\lambda_2 - \lambda_1)}$ (D) $\frac{(E_2\lambda_2 + E_1\lambda_1)}{(\lambda_1 - \lambda_2)}$

48. In an ammeter, 0.25% of main current passes through the galvanometer. If the resistance of the galvanometer is ' G ', the resistance of ammeter will be

(A) $\frac{399}{400}$G (B) $\frac{1}{400}$G

(C) $\frac{499}{500}$G (D) $\frac{1}{500}$G

49. A simple pendulum of length ' l ' has a brass bob attached at its lower end. It's period is ' T '. A steel bob of the same size, having density ' x ' times that of brass, replaces the brass bob. Its length is then so changed that the period becomes ' 2 T '. What is the new length?

(A) $4lx$ (B) $\frac{4l}{x}$

(C) $4l$ (D) $2l$

50. The electric potential at a point on the axis of an electric dipole is proportional to [r = distance between centre of the electric dipole and the point]

(A) $\frac{1}{r}$ (B) $\frac{1}{r^2}$

(C) r (D) $\frac{1}{r^3}$

51. Calculate dissociation constant of a weak monobasic acid if it is 0.05% dissociated in 0.02 M solution.

(A) 2.0×10^{-9} (B) 3.0×10^{-9}

(C) 4.0×10^{-9} (D) 5.0×10^{-9}

52. Select the correct increasing order of boiling points of alcohols, amines and carboxylic acids of comparable molar mass from the following.

(A) Alcohols < Amines < Carboxylic acids

(B) Amines < Carboxylic acids < Alcohols

(C) Amines < Alcohols < Carboxylic acid

(D) Carboxylic acids < Alcohols < Amines

53. Which of the following orbitals is represented by n = 3 and $l = 2$?

(A) 3s (B) 3p

(C) 3d (D) 3f

54. Which of the following is not a property of hydrogen peroxide?

(A) It is immiscible in water.

(B) It is pale blue coloured liquid in pure state.

(C) Its strength is explained in volume unit.

(D) It is mild oxidising as well as reducing agent.

55. The molar conductivity of 0.01 M acetic acid at 25°C is $16.5\Omega^{-1}\ cm^2\ mol^{-1}$ and its molar conductivity at zero concentration is $390.7\Omega^{-1}\ cm^2\ mol^{-1}$. What is its degree of dissociation?

(A) 0.0223 (B) 0.0422

(C) 0.0642 (D) 0.0821

56. Which from following reactions exhibits good atom economy according to the principles of green chemistry?

(A) $C_4H_9OH + NaBr + H_2SO_4 \longrightarrow C_4H_9Br + NaHSO_4 + H_2O$

(B) $C_2H_4 + H_2 \xrightarrow{Ni} C_2H_6$

(C) $C_2H_5OH + C_2H_5COOH \longrightarrow C_2H_5COOC_2H_5 + H_2O$

(D) $C_4H_9OH + SOCl_2 \xrightarrow{\Delta} C_4H_9Cl + HCl + SO_2$

57. Which from following statements is NOT true about absorption?

(A) Concentration of absorbate is uniform throughout the bulk of the absorbent.

(B) It is independent of temperature and pressure.

(C) It is not accompanied by evolution or absorption of heat.

(D) It depends on surface area.

58. Identify the source of linen from following:

(A) Flax plant (B) Cotton plant

(C) Cane plant (D) Rubber plant

59. Identify acidic amino acid from following (represented by using three letter symbols).

(A) Arg (B) Asp

(C) Asn (D) Ala

60. What is the number of moles of ionisable Cl^- ions in a coordinate complex if it forms two moles of AgCl when treated with silver nitrate solution in excess?

(A) 1 (B) 2

(C) 3 (D) 4

61. Identify the number of moles of H atoms present in n moles of organic compound represented as



(A) 4 n (B) 6 n

(C) 8 n (D) 2 n

62. What is the number of chiral carbon atoms in threose?

(A) One (B) Two

(C) Three (D) Four

63. Identify a complex having monodentate ligand from following :

(A) Tetracyanonickelate(II) ion

(B) Potassium trioxalatoaluminate(III)

(C) Trioxalatocobaltate(III) ion

(D) bis(ethylenediamine)dithiocyanato platinum(IV)

64. Which element from following does NOT exhibit magnetic moment in +2 state?

(A) Mn (B) Co

(C) Fe (D) Zn

65. Which from following statements is NOT correct about thermoplastic polymers?

(A) These are softened on heating.

(B) Intermolecular forces involved in these are moderately strong intermediate between elastomers and fibres.

(C) These possess extensive cross linking by covalent bonds.

(D) These are easily moulded.

66. Which from following elements is NOT a member of group 16 from periodic table?

(A) Tellurium (B) Selenium

(C) Polonium (D) Astatine

67. Identify false statement about transition elements.

(A) These exhibit properties between those of s and p block elements.

(B) All these elements are grouped as 3 d to 6 d series.

(C) 5 d series is comprised of all elements from La($Z = 57$) to Hg($Z = 80$).

(D) Elements of 6 d series belongs to 7^{th} period of periodic table.

68. Which among the following is not haloalkyne?

(A) $CH_3 - CH_2 - CH = CH - X$

(B) $CH_3 - C \equiv C - CH_2 - X$

(C) $CH \equiv C - CH_2 - CH_2 - X$

(D) $CH_3 - CH_2 - C \equiv C - X$

69. Which isomer of C_4H_9OH has highest boiling point?

(A) n-Butyl alcohol (B) Isobutyl alcohol

(C) sec-Butyl alcohol (D) tert-Butyl alcohol

70. A buffer solution contains equal concentrations of weak acid and its salt with strong base. Calculate pH of buffer solution if dissociation constant of weak acid is 1.8×10^{-5}.

(A) 4.7447 (B) 5.1420

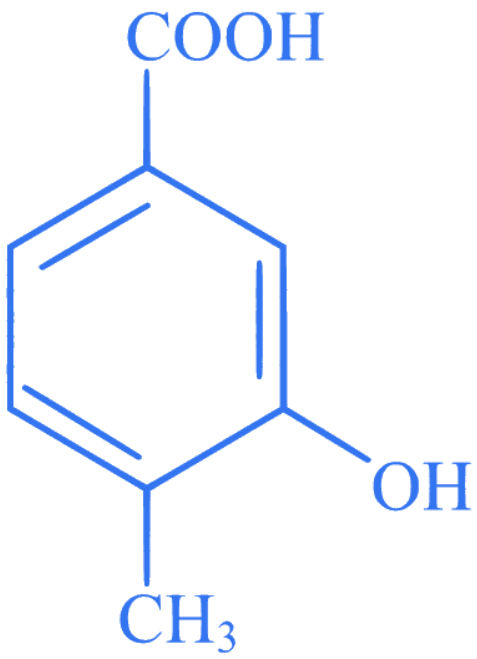
(C) 5.8496 (D) 4.0128

71. If four different elements A, B, C and D having electronic configuration as A = [Ne]3 $s^2 3p^4$, B = [Ne]3 $s^2 3p^5$, C = [Ar]3 $d^{10} 4 s^2 4p^4$ and D = [Ar]3 $d^{10} 4 s^2 4p^5$.
Identify the element with largest atomic radius.

(A) A (B) B

(C) C (D) D

72. What is IUPAC name of the following compound?



(A) 3-Carboxy-6-methylphenol

(B) 5-Carboxy-2-methylphenol

(C) 3-Hydroxy-4-methylbenzoic acid

(D) 4-methyl-5-hydroxybenzoic acid

73. For the reaction $A + B \longrightarrow$ product, rate law equation is, rate $= k[A]^2[B]$. If rate of reaction is $0.22\ mol\ L^{-1}\ s^{-1}$, calculate rate constant. ($[A] = 1\ mol\ L^{-1}, [B] = 0.25\ mol\ L^{-1}$)

(A) $0.44\ mol^{-2}\ L^2\ s^{-1}$ (B) $0.88\ mol^{-2}\ L^2\ s^{-1}$

(C) $1.136\ mol^{-2}\ L^2\ s^{-1}$ (D) $3.52\ mol^{-2}\ L^2\ s^{-1}$

74. Which of the following is NOT obtained when a mixture of methyl bromide and ethyl bromide is treated with sodium metal in presence of dry ether?

(A) Ethane (B) Propane

(C) Butane (D) Pentane

75. Calculate the volume of simple cubic unit cell if the radius of particle in it is 400 pm.

(A) $6.36 \times 10^{-22}\ cm^3$ (B) $5.12 \times 10^{-22}\ cm^3$

(C) $5.84 \times 10^{-22}\ cm^3$ (D) $6.60 \times 10^{-22}\ cm^3$

76. Calculate the solubility of a gas having partial pressure 0.15 bar at 25°C. $[K_H = 0.16\ moldm^{-3}bar^{-1}]$

(A) $2.4 \times 10^{-2}\ mol\ dm^{-3}$

(B) $3.0 \times 10^{-2}\ mol\ dm^{-3}$

(C) $2.7 \times 10^{-2}\ mol\ dm^{-3}$

(D) $1.8 \times 10^{-2}\ mol\ dm^{-3}$

77. What is the frequency of violet light having wavelength 400 nm ?

(A) 3.0×10^{14} Hz (B) 4.0×10^{14} Hz

(C) 7.5×10^{14} Hz (D) 9.0×10^{14} Hz

78. Identify the product ' B ' in the following series of reactions.

$$\text{Propan -1-ol} \xrightarrow[623\ K]{A_2O_3} A \xrightarrow[i)\ H_2O]{i)\ Conch_2SO_4} B$$

(A) Propene (B) Propanal

(C) Propanone (D) Propan-2-ol

79. Identify an aldehyde used in margarine and in food for its buttery odour.

(A) Benzaldehyde (B) Butyraldehyde

(C) Cinnamaldehyde (D) Oxaldehyde

80. Identify the major product formed in the bromination of 2-Methylpropane.

(A) 1-Bromopropane (B) 2-Bromopropane

(C) 1-Bromo-2-methylpropane (D) 2-Bromo-2-methylpropane

81. For an ideal gas, the heat of reaction at constant pressure and heat of reaction at constant volume are related by equation _____

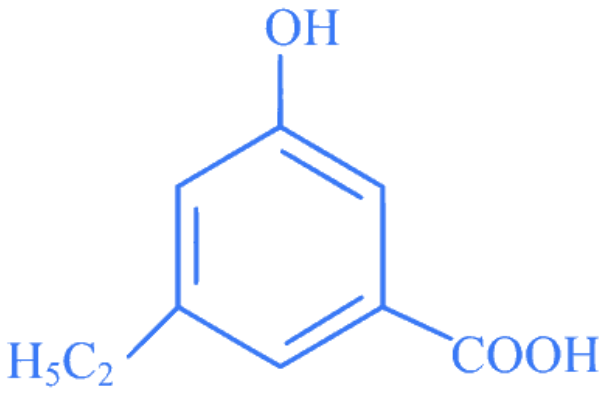
(A) $H + U = PV$

(B) $U = H + P\Delta V$

(C) $\Delta U = \Delta H + \frac{\Delta n}{RT}$

(D) $\Delta H = \Delta U + \Delta nRT$

82. What is IUPAC name of the following compound?



(A) 3-Carboxy-5-ethylphenol (B) 5-Carboxy-3-ethylphenol

(C) 3-Ethyl-5-hydroxybenzoic acid (D) 5-Ethyl-3-hydroxybenzoic acid

83. Which of the following is a tertiary allylic alcohol?

(A) Prop-2-en-1-ol (B) But-3-en-2-ol

(C) 2-methylprop-2-en-1-ol (D) 2-methylbut-3-en-2-ol

84. Which of the following is Mendius reduction?

(A) $R - CONH_2 \xrightarrow[\Delta]{Br_2, KOH_{(aq)}} R - NH_2$

(B) $R - NH_2 \xrightarrow{RX\ (excess)} R_4NX$

(C) $R_4NX \xrightarrow[\Delta]{Moist\ Ag_2O}$ Alkene $+ R_3N$

(D) $R - CN \xrightarrow[or\ LiAlH_4]{Na/C_2H_5OH} R - CH_2NH_2$

85. For the reaction $CH_{4(g)} + H_{2(g)} \longrightarrow C_2H_{6(g)}$ $K_p = 3.356 \times 10^{17}$, calculate ΔG° for the reaction at 298 K .

(A) -90 kJ (B) -100 kJ

(C) 235.6 kJ (D) 33.56 kJ

86. Rate of a first order reaction is 1.5×10^{-2} mol L^{-1} minute $^{-1}$ at 0.5 M concentration of reactant, calculate half life of reaction.

(A) 0.383 minute
(B) 7.53 minute
(C) 8.73 minute
(D) 23.1 minute

87. Calculate the density of a metal molar mass 197 g mol^{-1} if it forms fcc structure. $\left[a^3 \times N_A = 40 \text{ cm}^3 \text{ mol}^{-1}\right]$

(A) 23.5 g cm^{-3}
(B) 21.2 g cm^{-3}
(C) 17.5 g cm^{-3}
(D) 19.7 g cm^{-3}

88. A gas expands isothermally against a constant external pressure of 1 bar from 10 dm^3 to 20 dm^3 by absorbing 800 J of heat from surrounding. Calculate value of ΔU.

(A) 100 J
(B) -200 J
(C) 200 J
(D) -300 J

89. Which from following decides the rate of multistep reaction?

(A) rate of slowest step.
(B) rate of fastest step.
(C) average rate of various steps.
(D) instantaneous rate of fast step.

90. What is minimum number of spheres required of develop a tetrahedral void?

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

91. Which from following ionic solids exhibits decrease in its solubility in water with increase of temperature?

(A) NaCl
(B) KNO_3
(C) $NaNO_3$
(D) Na_2SO_4

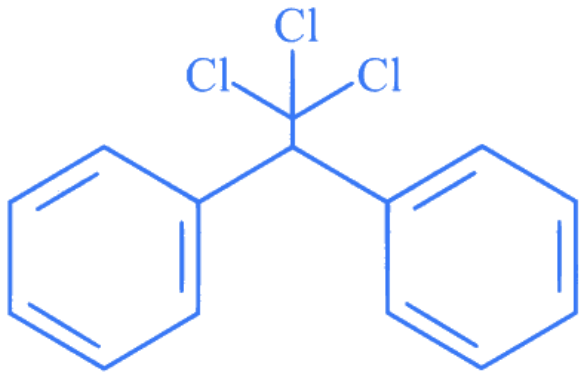
92. Which from the following equations represents the relation between solubility (mol L^{-1}) and solubility product for a salt B_3A_2 ?

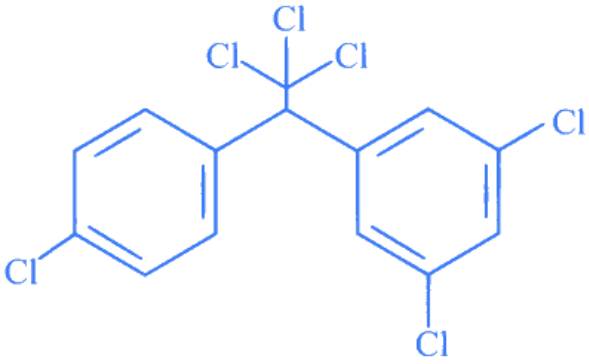
(A) $S = (\frac{K_{sp}}{108})^{\frac{1}{5}}$
(B) $S = (108 \times K_{sp})^{1/5}$
(C) $S = (\frac{K_{sp}}{27})^{\frac{1}{5}}$
(D) $S = (27 \times K_{sp})^{1/5}$

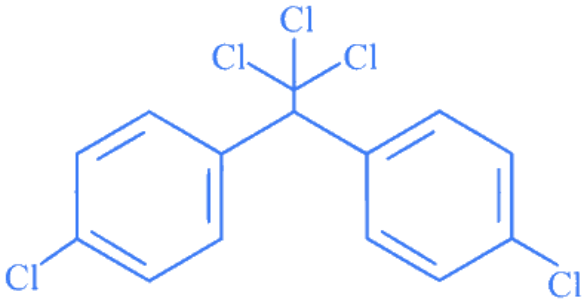
93. Which of the following is released at cathode during electrolysis of aqueous sodium chloride?

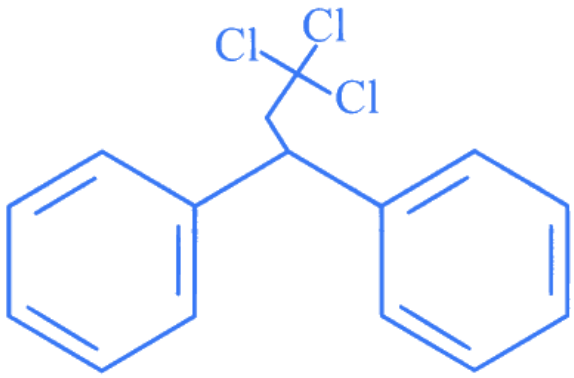
(A) $Cl_{2(g)}$
(B) $Na_{(s)}$
(C) $O_{2(g)}$
(D) $H_{2(g)}$

94. Identify structural formula of DDT.

(A)


(B)


(C)


(D)


95. What is the change in oxidation number of S in following reaction?

$$H_2S + NO_3^- \longrightarrow H_2O + NO + S$$

(A) -2 to 0
(B) 0 to -2
(C) -2 to $+2$
(D) 0 to $+2$

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96. Which law is illustrated by compounds H_2O and H_2O_2 formed from two different elements, H and O ?

(A) Law of Constant proportion.
(B) Law of Conservation of mass.
(C) Law of Multiple proportion.
(D) Avogadro's law.

97. Calculate the E°_{cell} of $Al\left|Al_2\left(SO_4\right)_{3(1M)}\right|\left|HCl_{(IM)}\right|H_{2(g)(1atm)}, Pt$ (Given $E^0_{AB^{3+}|A|} = -1.66$ V)

(A) 1.66 V
(B) -1.66 V
(C) 0.0533 V
(D) 1.14 V

98. What is the volume of a gas at 1.032×10^5 Nm^{-2} if it occupies 1 dm^3 of volume at normal temperature and pressure?

(A) 0.982 dm^3
(B) 1.3 dm^3
(C) 1.5 dm^3
(D) 1.7 dm^3

99. Calculate molar mass of nonvolatile solute if a solution containing 0.35 g solute in 100 g water has boiling point elevation 0.01 K $\left[K_b = 0.50 \text{ K kg mol}^{-1}\right]$

(A) 265 g mol^{-1}
(B) 175 g mol^{-1}
(C) 105 g mol^{-1}
(D) 195 g mol^{-1}

100. What is the number of Lewis structures for NO_2^-?

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

101. Let two non-collinear unit vectors $\hat{a}$ and $\hat{b}$ form an acute angle. A point P moves, so that at any time t the position vector $\overrightarrow{OP}$, where O is the origin, is given by $\hat{a}\cos t + \hat{b}\sin t$. When P is farthest from origin O , let M be the length of $\overrightarrow{OP}$ and $\hat{u}$ be the unit vector along $\overrightarrow{OP}$, then

(A) $\hat{u} = \frac{\hat{a}+\hat{b}}{|\hat{a}+\hat{b}|}$ and $M = (1+\hat{a}\cdot\hat{b})^{\frac{1}{2}}$

(B) $\hat{u} = \frac{\hat{a}-\hat{b}}{|\hat{a}-\hat{b}|}$ and $M = (1+\hat{a}\cdot\hat{b})^{\frac{1}{2}}$

(C) $\hat{u} = \frac{\hat{a}+\hat{b}}{|\hat{a}+\hat{b}|}$ and $M = (1+2\hat{a}\cdot\hat{b})^{\frac{1}{2}}$

(D) $\hat{u} = \frac{\hat{a}-\hat{b}}{|\hat{a}-\hat{b}|}$ and $M = (1-2\hat{a}\cdot\hat{b})^{\frac{1}{2}}$

102. The vector equation of the plane passing through the point $A(1,2,-1)$ and parallel to the vectors $2\hat{i}+\hat{j}-\hat{k}$ and $\hat{i}-\hat{j}+3\hat{k}$ is

(A) $\bar{r}\cdot(2\hat{i}+7\hat{j}+3\hat{k}) = -9$

(B) $\bar{r}\cdot(\hat{i}+2\hat{j}+2\hat{k}) = 9$

(C) $\bar{r}\cdot(3\hat{i}+2\hat{j}-2\hat{k}) = 9$

(D) $\bar{r}\cdot(2\hat{i}-7\hat{j}-3\hat{k}) = -9$

103. In a triangle ABC , with usual notations, if $m\angle A = 45^\circ, m\angle B = 75^\circ$, then $a + c\sqrt{2}$ has the

(A) b (B) $\frac{b}{2}$

(C) $2b$ (D) $3b$

104. If y is a function of x and $\log(x+y) = 2xy$, then the value of $y'(0)$ is

(A) 1 (B) -1

(C) 2 (D) 0

105. If $\bar{a}, \bar{b}, \bar{c}$ are mutually perpendicular vectors having magnitudes $1, 2, 3$ respectively, then the value of $\begin{bmatrix} \bar{a}+\bar{b}+\bar{c} & \bar{b}-\bar{a} & \bar{c} \end{bmatrix}$ is

(A) 0 (B) 6

(C) 12 (D) 18

106. The volume of a ball is increasing at the rate of 4πcc/sec. The rate of increase of the radius, when the volume is 288πcc, is

(A) $\frac{1}{6}$ cm/sec (B) $\frac{1}{36}$ cm/sec

(C) 6 cm/sec (D) 36 cm/sec

107.

$$\int_0^{\frac{\pi}{4}} \log\left(\frac{\sin x + \cos x}{\cos x}\right)dx =$$

(A) $\frac{\pi}{2}\log 2$ (B) $\frac{\pi}{4}\log 2$

(C) $\frac{\pi}{6}\log 2$ (D) $\frac{\pi}{8}\log 2$

108. A and B are independent events with $P(A) = \frac{3}{10}$, $P(B) = \frac{2}{5}$, then $P(A' \cup B)$ has the value

(A) $\frac{41}{50}$ (B) $\frac{41}{125}$

(C) $\frac{7}{25}$ (D) $\frac{7}{50}$

109. Let $f(x) = (x-1)(x-2)(x-3), x \in [0,4]$. Values of C will be _____ if L.M.V.T. (Lagrange's Mean Value Theorem) can be applied.

(A) $\frac{4-2\sqrt{3}}{3}, \frac{4+2\sqrt{3}}{3}$ (B) $\frac{6-2\sqrt{3}}{3}, \frac{6+2\sqrt{3}}{3}$

(C) $\frac{6-\sqrt{3}}{3}, \frac{6+\sqrt{3}}{3}$ (D) $2-\sqrt{3}, 2+\sqrt{3}$

110. The general solution of the differential equation $e^{y-x}\frac{dy}{dx} = y\left(\frac{\sin x+\cos x}{1+y\log y}\right)$ is

(A) $e^y \log y = e^x \sin x + c$, where c is a constant of integration.

(B) $e^y = e^x \sin x + c$, where c is a constant of integration.

(C) $\log y = e^x \sin x + c$, where c is a constant of integration.

(D) $y\log y = e^x \sin x + c$, where c is a constant of integration.

111. Minimum number of times a fair coin must be tossed, so that the probability of getting at least one head, is more than 99% is

(A) 5 (B) 6

(C) 7 (D) 8

112. The vector of magnitude 6 units and perpendicular to vectors $2\hat{i}+\hat{j}-3\hat{k}$ and $\hat{i}-2\hat{j}+\hat{k}$ is

(A) $2\sqrt{3}(-\hat{i}+\hat{j}+\hat{k})$ (B) $2\sqrt{3}(\hat{i}-\hat{j}+\hat{k})$

(C) $2\sqrt{3}(\hat{i}+\hat{j}+\hat{k})$ (D) $2\sqrt{3}(-\hat{i}-\hat{j}+\hat{k})$

113. The shortest distance between lines $\bar{r} = (\hat{i}+2\hat{j}-\hat{k}) + \lambda(2\hat{i}+\hat{j}-3\hat{k})$ and $\bar{r} = (2\hat{i}-\hat{j}+2\hat{k}) + \mu(\hat{i}-\hat{j}+\hat{k})$ is

(A) $\frac{4\sqrt{2}}{19}$ units (B) $\frac{3\sqrt{2}}{\sqrt{19}}$ units

(C) $\frac{5\sqrt{2}}{\sqrt{19}}$ units (D) $\frac{2\sqrt{2}}{\sqrt{19}}$ units

114. The graphical solution set of the system of inequations $x+y \geq 1, 7x+9y \leq 63, y \leq 5, x \leq 6, x \geq 0, y \geq 0$ is represented by

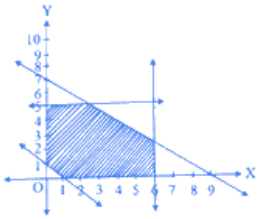


Fig. 1

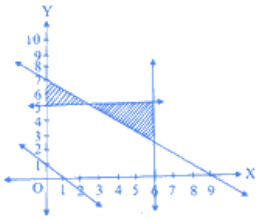


Fig. 2

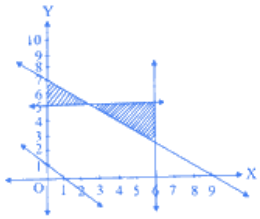


Fig. 3

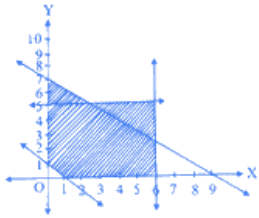


Fig. 4

(A) Fig. 1 (B) Fig. 2
(C) Fig. 3 (D) Fig. 4

115. $\tan\left(\cos^{-1}\frac{1}{\sqrt{2}}+\tan^{-1}\frac{1}{2}\right)=$

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

116. If $x^2y^2=\sin^{-1}x+\cos^{-1}x$, then $\frac{dy}{dx}$ at $x=1$ and $y=2$ is

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

117. If $\overline{a}=\hat{j}-\hat{k}$ and $\overline{c}=\hat{i}-\hat{j}-\hat{k}$, then the vector $\overline{b}$ satisfying $\overline{a}\times\overline{b}+\overline{c}=\overline{0}$ and $\overline{a}\cdot\overline{b}=3$ is

(A) $-\hat{i}+\hat{j}-2\hat{k}$ (B) $-\hat{i}+\hat{j}-\hat{k}$
(C) $-\hat{i}-\hat{j}+\hat{k}$ (D) $\hat{i}+\hat{j}+\hat{k}$

118. The expression $((p\wedge q)\vee(p\vee\sim q))\wedge(\sim p\wedge\sim q)$ is equivalent to

(A) $p\wedge q$ (B) $p\vee\sim q$
(C) $p\wedge\sim q$ (D) $(\sim p)\wedge(\sim q)$

119. If $y=4x-5$ is a tangent to the curve $y^2=px^3+q$ at $(2,3)$, then the values of p and q are respectively

(A) $-2,7$ (B) $7,-2$
(C) $2,-7$ (D) $-7,-2$

120. If $w=\frac{-1-i\sqrt{3}}{2}$ where $i=\sqrt{-1}$, then the value of $\begin{vmatrix}1 & w & w^2\\ w & w^2 & 1\\ w^2 & 1 & w\end{vmatrix}$ is

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

121.
$$\int_0^a \frac{x-a}{x+a}dx=$$

(A) $a-2a\log 2$ (B) $a-a\log 2$
(C) $a+2a\log 2$ (D) $a+a\log 2$

122. Let PQ and RS be tangents at the extremities of the diameter PR of a circle of radius r. If PS and RQ intersect at a point X on the circumference of the circle, then 2 r equals

(A) $\sqrt{PQ\cdot RS}$ (B) $\frac{PQ+RS}{2}$
(C) $\frac{2\cdot PQ\cdot RS}{PQ+RS}$ (D) $\sqrt{\frac{PQ^2+RS^2}{2}}$

123. A random variable X assumes values $1,2,3,\ldots\ldots,n$ with equal probabilities. If $\text{var}(X):E(X)=4:1$, then n is equal to

(A) 20 (B) 15
(C) 25 (D) 10

124. $\overline{a}=\hat{i}+\hat{j}+\hat{k}, \overline{b}=4\hat{i}-2\hat{j}+3\hat{k}, \overline{c}=\hat{i}-2\hat{j}+\hat{k}$, then a vector of magnitude 6 units, which is parallel to the vector $2\bar{a}-\bar{b}+3c$, is

(A) $2\hat{i}-4\hat{j}+4\hat{k}$ (B) $\hat{i}-\hat{j}+2\hat{k}$
(C) $4\hat{i}+4\hat{j}-2\hat{k}$ (D) $2\hat{i}+4\hat{j}+4\hat{k}$

125. If $y=\sin^2\left(\cot^{-1}\sqrt{\frac{1+x}{1-x}}\right)$, then $\frac{dy}{dx}$ has the value

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

126. If the line $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{4}$ and $\frac{x-3}{1}=\frac{y-k}{2}=\frac{z}{1}$ intersect, then the value of k is

(A) $\frac{3}{2}$ (B) $\frac{9}{2}$
(C) $-\frac{2}{9}$ (D) $-\frac{3}{2}$

127. Inverse of the matrix $\begin{bmatrix} 0.8 & -0.6 \\ 0.6 & 0.8 \end{bmatrix}$ is

(A) $\begin{bmatrix} 0.8 & 0.6 \\ -0.6 & 0.8 \end{bmatrix}$ (B) $\begin{bmatrix} -0.8 & 0.6 \\ -0.6 & 0.8 \end{bmatrix}$

(C) $\begin{bmatrix} -0.8 & -0.6 \\ 0.6 & 0.8 \end{bmatrix}$ (D) $\begin{bmatrix} 8 & -6 \\ 6 & 8 \end{bmatrix}$

128. $\int \frac{dx}{\sqrt{e^x-1}} = 2\tan^{-1}(f(x)) + c$ where $x > 0$ and c is a constant of integration, then $f(x)$ is

(A) $e^x - 1$ (B) $\sqrt{e^x - 1}$

(C) $e^x + 1$ (D) $\sqrt{e^x + 1}$

129. If $f(x) = \left(\frac{1+\tan x}{1+\sin x}\right)^{\operatorname{cosec} x}$ is continuous at $x = 0$ then $f(0)$ is equal to

(A) 0 (B) 1

(C) e (D) $\frac{1}{e}$

130. The value of $\cos\left(2\cos^{-1}x + \sin^{-1}x\right)$ at $x = \frac{1}{5}$ is

(A) $-\frac{\sqrt{6}}{5}$ (B) $\frac{2\sqrt{6}}{5}$

(C) $-\frac{2\sqrt{6}}{5}$ (D) $\frac{2\sqrt{5}}{6}$

131. $\int_{\frac{-\pi}{4}}^{\frac{\pi}{4}} (\sin x)^{-4}\, dx$ has the value

(A) $\frac{-3}{2}$ (B) $\frac{3}{2}$

(C) $\frac{-8}{3}$ (D) $\frac{8}{3}$

132. The mean and variance of 7 observations are 8 and 16 respectively. If first five observations are $2, 4, 10, 12, 14$, then absolute difference of remaining two observations is

(A) 1 (B) 2

(C) 3 (D) 4

133. The projection of $\overline{AB}$ on $\overline{CD}$, where $A \equiv (2, -3, 0), B \equiv (1, -4, -2), C \equiv (4, 6, 8)$ and $D \equiv (7, 0, 10)$ is

(A) $\frac{1}{\sqrt{6}}$ (B) $\frac{1}{7}$

(C) $\frac{4}{\sqrt{6}}$ (D) $\frac{4}{7}$

134. The equation of the plane through the point $(2, -1, -3)$ and parallel to the lines $\frac{x-1}{3} = \frac{y+2}{2} = \frac{z}{-4}$ and $\frac{x}{2} = \frac{y-1}{-3} = \frac{z-2}{2}$ is

(A) $8x + y - 13z + 27 = 0$

(B) $2x + y + z = 0$

(C) $3x - y - z - 10 = 0$

(D) $8x + 14y + 13z + 37 = 0$

135. If x, y, z are in Arithmetic Progression and $\tan^{-1}x, \tan^{-1}y, \tan^{-1}z$ are also in Arithmetic progression, where $x, z > 0$ and $xz < 1, y < 1$, then

(A) $x = y = z$ (B) $2x = 3y = 6z$

(C) $6x = 3y = 2z$ (D) $6x = 4y = 3z$

136. Derivative of $\tan^{-1}\sqrt{\frac{1-x}{1+x}}$ w.r.t. $\cos^{-1}\left(4x^3 - 3x\right)$ is

(A) $\frac{-1}{6}$ (B) $\frac{2}{3}$

(C) $\frac{3}{2}$ (D) $\frac{1}{6}$

137. If $\frac{d}{dx}f(x) = 4x^3 - \frac{3}{x^4}$ such that $f(2) = 0$, then $f(x)$ is equal to

(A) $x^4 + \frac{1}{x^3} + \frac{129}{8}$ (B) $x^4 + \frac{1}{x^3} - \frac{129}{8}$

(C) $x^3 + \frac{1}{x^4} + \frac{129}{8}$ (D) $x^3 + \frac{1}{x^4} - \frac{129}{8}$

138.

$$\lim_{x \to 0} \frac{9^x - 4^x}{x\left(9^x + 4^x\right)} =$$

(A) $\log\left(\frac{3}{2}\right)$ (B) $\frac{1}{2}\log\left(\frac{3}{2}\right)$

(C) $2\log\left(\frac{3}{2}\right)$ (D) $2\log\left(\frac{9}{4}\right)$

139. If the length of the perpendicular to a line from the origin is $2\sqrt{2}$ units, which makes an angle of 135° with the X -axis, then the equation of line is

(A) $x + y = 4$ (B) $x - y + 4 = 0$

(C) $x - y = 4$ (D) $x + y + 4 = 0$

140. A spherical rain drop evaporates at a rate proportional to its surface area. If initially its radius is 3 mm and after 1 second it is reduced to 2 mm , then at any time t its radius is (where $0 \le t < 3$)

(A) $3 + t$ (B) $3 - t$

(C) $4 - t$ (D) $1 + t$

141. If $\bar{a} = 2\hat{i} + 2\hat{j} + 3\hat{k}, \bar{b} = -\hat{i} + 2\hat{j} + \hat{k}$ and $\bar{c} = 3\hat{i} + \hat{j}$ such that $\bar{b} + \lambda\bar{a}$ is perpendicular to $\bar{c}$, then λ is

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$

(C) $\frac{1}{6}$ (D) $\frac{1}{8}$

142. The number of integer values of m, for which x-coordinate of the point of intersection of the lines $3x + 4y = 9$ and $y = mx + 1$ is also an integer, is

(A) 2 (B) 0

(C) 4 (D) 1

143. If $\tan^{-1}(x+2)+\tan^{-1}(x-2)-\tan^{-1}\left(\frac{1}{2}\right)=0$, then one value of x is

(A) -1 (B) $\frac{1}{2}$

(C) 1 (D) 2

144. The value of $\int \frac{dx}{x^2(x^4+1)^{\frac{3}{4}}}$ is

(A) $(\frac{-x^4+1}{x^4})^{\frac{1}{4}}+c$, where c is constant of integration.

(B) $(x^4+1)^{\frac{1}{4}}+c$, where c is constant of integration.

(C) $-(x^4+1)^{\frac{1}{4}}+c$, where c is constant of integration.

(D) $-(\frac{x^4+1}{x^4})^{\frac{1}{4}}+c$, where c is constant of integration.

145. The converse of "If 3 is a prime number, then 3 is odd." is

(A) If 3 is odd then it is a prime number.

(B) If 3 is not a prime number then 3 is even.

(C) If 3 is a prime number then 3 is even.

(D) If 3 is not a prime number then 3 is not odd.

146.

$$\int \sin^{-1}\left(\frac{2x}{1+x^2}\right)dx =$$

(A) $2x\tan^{-1}x-\log(1+x^2)+c$, where c is a constant of integration.

(B) $2(x\tan^{-1}x-\log(1+x^2))+c$, where c is a constant of integration.

(C) $x\tan^{-1}x+\log(1+x^2)+c$, where c is a constant of integration.

(D) $2(x\tan^{-1}x+\log(1+x^2))+c$, where c is a constant of integration.

147. Let $f(x)=\frac{ax}{x+1}, x\neq -1$, then for $\alpha=$ _____, $f(f(x))=x$.

(A) $\sqrt{2}$ (B) $-\sqrt{2}$

(C) 1 (D) -1

148. The area (in sq. units) of the region $\{(x,y)/x\geq 0, x+y\leq 3, x^2\leq 4y$ and $y\leq 1+\sqrt{x}\}$ is

(A) $\frac{9}{2}$ (B) $\frac{3}{2}$

(C) $\frac{7}{2}$ (D) $\frac{5}{2}$

149. The order of the differential equation, whose general solution is given by

$$y=(c_1+c_2)\cos(x+c_3)-c_4e^{x+c5}$$

where c_1, c_2, c_3, c_4 and c_5 are arbitrary constant, is

(A) 5 (B) 4

(C) 3 (D) 2

150. If $(p\wedge\sim r)\rightarrow(\sim p\vee q)$ has truth value False, then truth values of p, q, r are respectively.

(A) F, F, T (B) F, T, F

(C) T, F, F (D) T, T, F

- End of Question Paper -