MHT CET 2024 PCM May 4 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**.

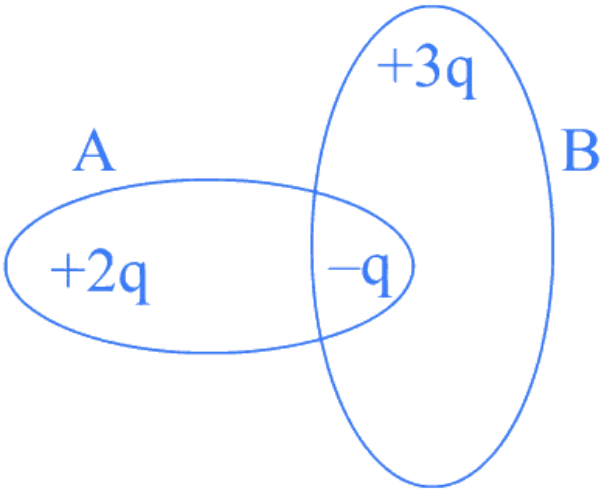
(iii) Each question offers **four choices**, with **one correct answer**.

(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. Two surfaces A and B are enclosing the charges as shown below. The total normal electric induction (T.N.E.I) through the surfaces A and B are respectively.



(A) $+2q$ and $+2q$ (B) $+q$ and $+3q$
(C) $+q$ and $+2q$ (D) $+2q$ and $+3q$

2. An alternating current is given by $\mathrm{I} = 100\sin(50\pi \mathrm{t})$. How many times will the current become zero in one second?

(A) 50 times (B) 25 times
(C) 40 times (D) 100 times

3. Two bodies ' X ' and ' Y ' at temperatures ' T_1 ' K and ' T_2 ' K respectively have the same dimensions. If their emissive powers are same, the relation between their temperatures is

(A) $\frac{T_1}{T_2} = \frac{1}{3}$ (B) $\frac{\mathrm{T}_1}{\mathrm{T}_2} = \frac{81}{1}$
(C) $\frac{\mathrm{T}_1}{\mathrm{T}_2} = \frac{3^{\frac{1}{4}}}{1}$ (D) $\frac{T_1}{T_2} = \frac{9^{\frac{1}{4}}}{1}$

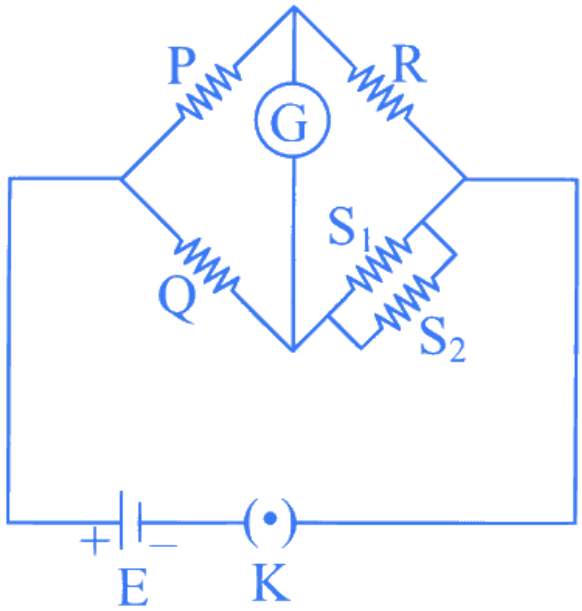
4. The planar concentric rings of metal wire having radii r_1 and r_2 (with $r_1 > r_2$) are placed in air. The current I is flowing through the coil of larger radius. The mutual inductance between the coils is given by (μ_0 = permeability of free space)

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

5. A spherical rubber balloon carries a charge, uniformly distributed over the surface. As the balloon is blown up and increases in size, the total electric flux coming out the surface

(A) becomes zero (B) decreases
(C) increases (D) remains unchanged

6. In a Wheatstone's bridge, the resistances in four arms are as shown in the figure. The balancing condition of the bridge is



(A) $\frac{\mathrm{P}}{\mathrm{Q}} = \frac{\mathrm{R}}{\mathrm{S}_1+\mathrm{S}_2}$ (B) $\frac{P}{Q} = \frac{R(S_1S_2)}{S_1+S_2}$
(C) $\frac{P}{Q} = \frac{R(S_1+S_2)}{2S_1S_2}$ (D) $\frac{\mathrm{P}}{\mathrm{Q}} = \frac{\mathrm{R}(\mathrm{S}_1+\mathrm{S}_2)}{\mathrm{S}_1\,\mathrm{S}_2}$

7. Two solid spheres (A and B) are made of metals having densities ρ_A and ρ_B respectively. If there masses are equal then ratio of their moments of inertia $\left(\frac{\mathrm{I_B}}{\mathrm{I_A}}\right)$ about their respective diameter is

(A) $(\frac{\rho_B}{\rho_A})^{2/3}$ (B) $(\frac{\rho_A}{\rho_B})^{2/3}$
(C) $\frac{\rho_A}{\rho_B}$ (D) $\frac{\rho_B}{\rho_A}$

8. A stationery wave is represented by $y = 12\cos\left(\frac{\pi}{6}x\right)\sin(8\pi t)$, where x&y are in cm and t in second. The distance between two successive antinodes is

(A) 12 cm (B) 10 cm
(C) 6 cm (D) 2 cm

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9. A hemispherical portion of radius ' R ' is removed from the bottom of a cylinder of radius ' R '. The volume of the remaining cylinder is ' V ' and its mass is ' M '. It is suspended by a string in a liquid of density ' ρ ', where it stays vertical. The upper surface of the cylinder is at a depth ' h ' below the liquid surface. The force on the bottom of the liquid is

(A) Mg
(B) $\mathrm{Mg} - \mathrm{V}\rho g$
(C) $\mathrm{Mg} + \pi \mathrm{R}^2\ \mathrm{h}\rho g$
(D) $\rho g(\mathrm{V} + \pi \mathrm{R}^2\ \mathrm{h})$

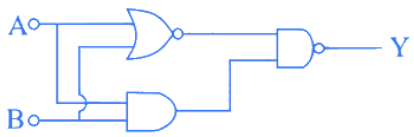
10. A parallel beam of light of intensity I_0 is incident on a glass plate, 25% of light is reflected by upper surface and 50% of light is reflected from lower surface. The ratio of maximum to minimum intensity in interference region of reflected rays is

(A) $[\frac{\frac{1}{2}+\sqrt{\frac{3}{8}}}{\frac{1}{2}-\sqrt{\frac{3}{8}}}]^2$
(B) $[\frac{\frac{1}{4}+\sqrt{\frac{3}{8}}}{\frac{1}{2}-\sqrt{\frac{3}{8}}}]^2$
(C) $\frac{5}{8}$
(D) $\frac{8}{5}$

11. A convex lens of refractive index $\frac{3}{2}$ has a power 2.5. If it is placed in a liquid of refractive index 2, the new power of the lens is

(A) 2.5 D
(B) -2.5 D
(C) 1.25 D
(D) -1.25 D

12. The truth table for the given logic circuit is



A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

(P)

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

(Q)

A	B	Y
0	0	1
0	1	0
1	0	1
1	1	1

(R)

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	1

(S)

(A) P
(B) Q
(C) R
(D) S

13. A single slit of width d is illuminated by violet light of wavelength 400 nm and the width of the diffraction pattern is measured as ' Y '. When half of the slit width is covered and illuminated by yellow light of wavelength 600 nm , the width of the diffraction pattern is

(A) zero
(B) $\frac{Y}{3}$
(C) 3 Y
(D) 4 Y

14. A thin uniform circular disc of mass ' M ' and radius ' R ' is rotating with angular velocity ' ω ' in a horizontal plane about an axis passing through its centre and perpendicular to its plane. Another disc of same radius but of mass $\left(\frac{\mathrm{M}}{3}\right)$ is placed gently on the first disc co-axially. The new angular velocity will be

(A) $\frac{2}{3}\omega$
(B) $\frac{3}{4}\omega$
(C) $\frac{4}{3}\omega$
(D) $\frac{5}{4}\omega$

15. A particle carrying a charge equal to 100 times the charge on an electron is rotating one rotation per second in a circular path of radius 0.8 m . The value of magnetic field produced at the centre will be (μ_0 = permeability of vacuum)

(A) $\frac{10^{-7}}{\mu_0}$
(B) $10^{-17}\mu_0$
(C) $10^{-6}\mu_0$
(D) $10^{-7}\mu_0$

16. A carpet of mass ' M ' made of a material is rolled along its length in the form of a cylinder of radius ' R ' and kept above the rough floor. If the carpet is unrolled without sliding to a radius ' $R/2$ '. The change in potential energy is (g = acceleration due to gravity)

(A) MgR
(B) $\frac{7}{8}$MgR
(C) $\frac{5}{7}$MgR
(D) $\frac{3}{4}$MgR

17. A water film is formed between two parallel wires of 10 cm length. The distance of 0.5 cm between the wires is increased by 1 mm . The work done in the process is (surface tension of water $= 72$ N/m)

(A) 2.88×10^{-2} J
(B) 7.2×10^{-2} J
(C) 1.44×10^{-2} J
(D) 3.6×10^{-2} J

18. A coil of self inductance L is connected in series with a bulb B and an a.c. source. Brightness of the bulb decreases when

(A) frequency of a.c. source is decreased.
(B) number of turns in the coil is reduced.
(C) a capacitance of reactance $(X_L - X_C)$ is included in the same circuit.
(D) an iron rod is inserted in the coil.

19. A transverse wave travelling along a stretched string has a speed of 30 m/s and a frequency of 250 Hz . The phase difference between two points on the string 10 cm apart at the same instant is

(A) 0^c
(B) $(\frac{\pi}{2})^c$
(C) $(\frac{5\pi}{3})^c$
(D) $(\frac{8\pi}{3})^c$

20. A lead bullet moving with velocity ' v ' strikes a wall and stops. If 50% of its energy is converted into heat, then the increase in temperature is (s = specific heat of lead)

(A) $\frac{v^2 s}{2J}$
(B) $\frac{v^2}{4Js}$
(C) $\frac{v^2 s}{J}$
(D) $\frac{2v^2}{Js}$

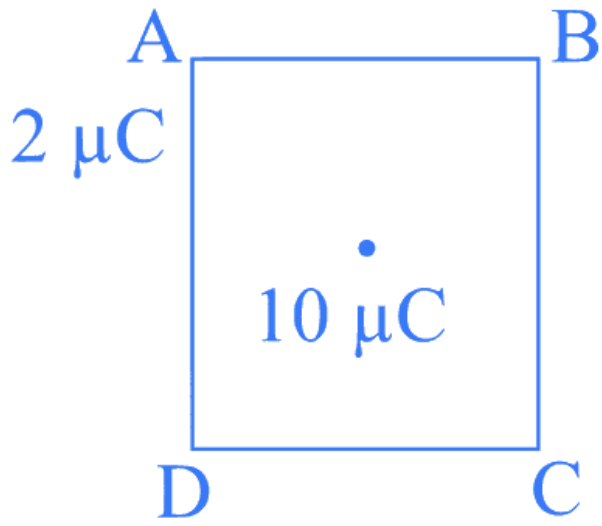
21. A pendulum is oscillating with frequency ' n ' on the surface of earth. If it is taken to a depth $\frac{R}{4}$ below the surface of earth, new frequency of oscillation of depth $\frac{R}{4}$ is (R = radius of earth)

(A) $\frac{2}{\sqrt{3}n}$
(B) $\frac{\sqrt{3}n}{2}$
(C) $\frac{2n}{\sqrt{3}}$
(D) $\frac{n}{4}$

22. The ratio of minimum wavelengths of Lyman and Balmer series will be

(A) 1.25
(B) 0.25
(C) 5
(D) 10

23. If a $10\mu C$ charge exists at the centre of a square, the work done in moving a $2\mu C$ point charge from corner A to corner B of a square ABCD is



(A) Zero
(B) 5
(C) 2
(D) 20

24. If C_p and C_v are molar specific heats of an ideal gas at constant pressure and volume respectively and ' γ ' is C_p/C_v then C_p = (R = universal gas constant)

(A) $\frac{\gamma R}{\gamma - 1}$
(B) γR
(C) $\frac{1+\gamma}{1-\gamma}$
(D) $\frac{R}{\gamma - 1}$

25. A magnetic field of 2×10^{-2} T acts at right angles to a coil of area 100 cm^2 with 50 turns, The average e.m.f. induced in the coil is 0.1 V , when it is removed from the field in time t. The value of ' t ' is (in second)

(A) 0.1 s
(B) 0.01 s
(C) 1 s
(D) 20 s

26. A body moves along a circular path of radius 15 cm . It starts from a point on the circular path and reaches the end of diameter in 3 second, The angular speed of the body in rad/s is

(A) $\frac{\pi}{2}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{5}$

27. The kinetic energy of an electron is increased by 2 times, then the de-Broglie wavelength associated with it changes by a factor.

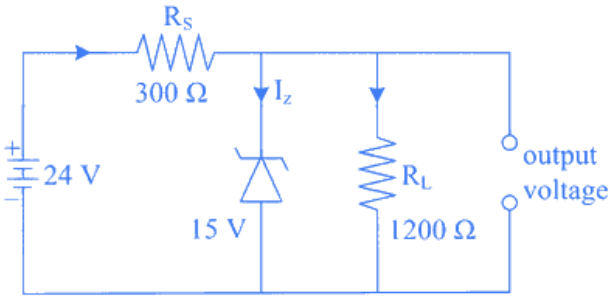
(A) $\frac{1}{3}$
(B) $\frac{1}{\sqrt{3}}$
(C) 3
(D) $\sqrt{3}$

28. The change in the internal energy of the mass of gas, when the volume changes from ' V ' to ' 2 V ' at constant pressure ' P ' is (γ is the ratio of specific heat of gas at constant pressure to specific heat at constant volume)

(A) $\frac{PV}{\gamma-1}$ (B) $\frac{PV}{\gamma+1}$

(C) $\frac{\gamma-1}{PV}$ (D) $\frac{\gamma+1}{PV}$

29. In the circuit diagram shown in figure, the current through the zener diode is



(A) 30 mA (B) 17.5 mA

(C) 15 mA (D) 12.5 mA

30. If the electric flux entering and leaving an enclosed surface are ϕ_1 and ϕ_2 respectively, the electric charge inside the surface will be

(A) $\frac{\varrho_2-\varrho_1}{\epsilon_0}$ (B) $\frac{\varrho_1+\varrho_2}{\epsilon_0}$

(C) $\epsilon_0(\varrho_1-\varrho_2)$ (D) $\epsilon_0(\varrho_2-\varrho_1)$

31. Some water is filled in a container of height 30 cm . If is is to appear half filled to the observer when viewed from the top of the container, the height upto which water should be filled in it, is [Refractive index of water $=\frac{4}{3}$]

(A) 15 cm (B) 18 cm

(C) 20 cm (D) 24 cm

32. A solid cylinder of mass ' M ' and radius ' R ' rolls down an inclined plane of height ' h '. When it reaches the foot of the plane, its rotational kinetic energy is (g = acceleration due to gravity)

(A) $\frac{Mgh}{3}$ (B) $\frac{Mgh}{6}$

(C) $\frac{Mgh}{4}$ (D) $\frac{Mgh}{2}$

33. The maximum velocity and maximum acceleration of a particle performing a linear S.H.M. is ' α ' and ' β ' respectively. Then the path length of the particle is

(A) $\frac{\alpha^2}{\beta}$ (B) $\frac{\beta\alpha^2}{2\alpha^2}$

(C) $\frac{2\alpha^2}{\beta}$ (D) $\frac{2\beta}{\alpha^2}$

34. When a galvanometer is shunted by a resistance ' s ', its current capacity increases ' n ' times. If the same galvanometer is shunted by another resistance ' s_1 ', its capacity will increase to ' n_1 ' times original current. The value of ' n_1 ' is

(A) $\frac{(n+s)}{s_1}$ (B) $\frac{s_1(n-s)-s_1}{s_1}$

(C) $\frac{(n+1)s}{s_1}$ (D) $\frac{s(n-1)+s_1}{s_1}$

35. A pergect gas of volume 5 litre is compressed isothermally to volume of 1 litre. The r.m.s. speed of the molecules will

(A) increase by 10 times (B) decrease by 10 times

(C) increase by 5 times (D) remain unchanged

36. An electron of mass ' m ' and charge ' q ' is accelerated from rest in a uniform electric field of intensity ' E '. The velocity acquired by it as it travels a distance ' l ' is ' v '. The ratio $\frac{q}{m}$ in terms of E, l and v is

(A) $\frac{v^2}{2El}$ (B) $\frac{v^2l}{2E}$

(C) $\frac{2E}{v^2l}$ (D) $\frac{v^2l}{E}$

37. In a biprism experiment, monochromatic light of wavelength ' γ ' is used. The distance between the two coherent sources ' d ' is kept constant. If the distance between slit and eyepiece ' D ' is varied as D_1, D_2, D_3, D_4 and corresponding measured fringe widths are W_1, W_2, W_3, W_4 then

(A) $W_1D_1 = W_2D_2 = W_3D_3 = W_4D_4$

(B) $\frac{W_1}{D_1} = \frac{W_2}{D_2} = \frac{W_3}{D_3} = \frac{W_4}{D_4}$

(C) $W_1\sqrt{D_1} = W_2\sqrt{D_2} = W_3\sqrt{D_3} = W_3\sqrt{D_3}$

(D) $D_1\sqrt{W_1} = D_2\sqrt{W_2} = D_3\sqrt{W_3} = D_4\sqrt{W_4}$

38. The ratio of weight of a man in a stationery lift and weight when the lift is moving downward with a uniform acceleration ' a ' is 3 : 2. Then the value of ' a ' is

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

(C) $\frac{2}{3}$ g (D) g

39. In series LCR resonant circuit, the capacitance is changed from C to 3 C . To obtain the same resonant frequency, the inductance should be changed from L to

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

(C) $\frac{L}{\sqrt{3}}$ (D) 3L

40. A mass ' m ' attached to a spring oscillates with a period of 3 second. If the mass is increased by 0.6 kg , the period increases by 3 second. The initial mass ' m ' is equal to

(A) 0.1 kg (B) 0.2 kg
(C) 0.3 kg (D) 0.4 kg

41. The depletion layer in p-n junction region is caused by

(A) drift of electrons. (B) migration of impurity ions.
(C) diffusion of charge carries. (D) drift of holes.

42. Half-lives of two radioactive elements A and B are 30 minute and 60 minute respectively. Initially the samples have equal number of nuclei. After 120 minute the ratio of decayed numbers of nuclei of B to that of A will be

(A) 1 : 15 (B) 1 : 4
(C) 4 : 5 (D) 5 : 4

43. A train sounding a whistle of frequency 510 Hz approaches a station at 72 km/hr. The frequency of the note heard by an observer on the platform as the train (1) approaches the station and then (2) recedes the station are respectively (in hertz) (velocity of sound in air $= 320$ m/s)

(A) $544, 480$ (B) $480, 544$
(C) $612, 544$ (D) $544, 612$

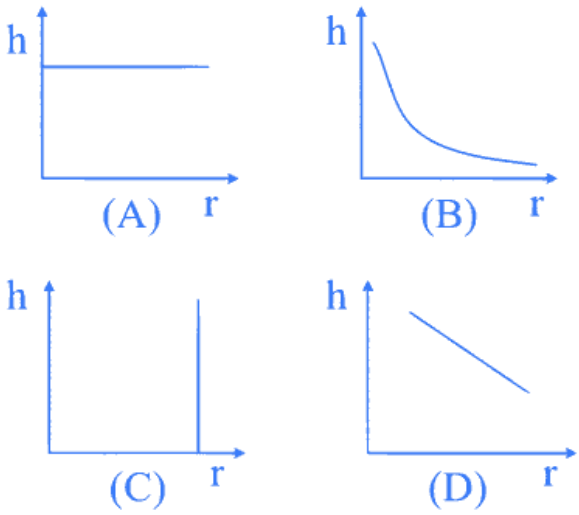
44. A set of 28 turning forks is arranged in an increasing order of frequencies. Each fork produces ' x ' beats per second with the preceding fork and the last fork is an octave of the first. If the frequency of the 12^{th} fork is 152 Hz , the value of ' x ' (no. of beats per second) is

(A) 2 (B) 4
(C) 6 (D) 8

45. A current of 0.5 A is passed through winding of a long solenoid having 400 turns. The magnetic flux linked with each turn is 3×10^{-3} Wb. The self inductance of the solenoid is

(A) 2.4 H (B) 2.0 H
(C) 1.2 H (D) 0.6 H

46. Identify the correct figure which shows the relation between the height of water column in a capillary tube and the capillary radius.



(A) (B) (B) (D)
(C) (A) (D) (C)

47. The escape velocity from earth surface is 11 km/s. The escape velocity from a planet having twice the radius and same mean density as earth is

(A) 22 km/s (B) 11 km/s
(C) 5.5 km/s (D) 15.5 km/s

48. A magnetic intensity of 500 A/m, produces a magnetic flux of 2.4×10^{-5} Wb in an iron bar of cross-sectional area 0.4 cm^2. The magnetic permeability of the iron bar is

(A) 2.4×10^{-3} N/m^2 (B) 1.2×10^{-3} N/m^2
(C) 2.4×10^{-4} N/m^2 (D) 1.2×10^{-4} N/m^2

49. A photosensitive metallic surface has work function ϕ. If photon of energy 3ϕ falls on the surface, the electron comes out with a maximum velocity of 6×10^6 m/s. When the photon energy is increased to 9ϕ, then maximum velocity of photoelectrons will be

(A) 12×10^6 m/s (B) 6×10^6 m/s
(C) 3×10^6 m/s (D) 24×10^6 m/s

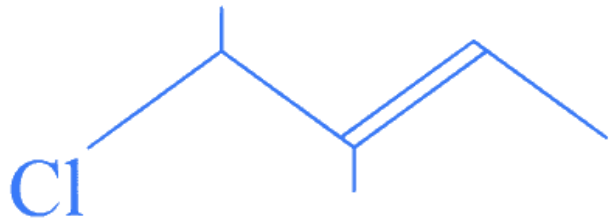
50. A real gas behaves as an ideal gas at

(A) low pressure and low temperature. (B) low pressure and high temperature.
(C) high pressure and low temperature. (D) high pressure and high temperature.

51. Identify the orbital having lowest energy from following.

(A) 2p (B) 3s
(C) 3d (D) 4p

52. What is the IUPAC name of following compound?



(A) 1-chloro-1,2-dimethylbut-2-ene (B) 4-chloro-3,4-dimethylbut-2-ene
(C) 4-chloro-3-methylpent-2-ene (D) 2-chloro-3-methylpent-3-ene

53. Which of the following is a molecular formula of cyclohexylamine?

(A) C_6H_8N (B) $C_6H_{10}N$
(C) $C_6H_{12}N$ (D) $C_6H_{13}N$

54. Calculate heat required to convert 9 g of liquid water to water vapours from following equations.

$$H_{2(g)} + \frac{1}{2}O_{2(g)} \longrightarrow H_2O_{(g)} \Delta H = -57 kCal$$

$$H_{2(g)} + \frac{1}{2}O_{2(g)} \longrightarrow H_2O_{(l)} \Delta H = -68.3 kCal$$

(A) 5.65 k Cal (B) 6.28 k Cal
(C) 7.05 k Cal (D) 9.72 k Cal

55. Which from following compounds is NOT in solid state at 25°C ?

(A) ICI (B) IBr
(C) IF_3 (D) IF_5

56. Calculate the molar mass of solute when 4 g of it dissolved in $1dm^3$ solvent has osmotic pressure 2 atm at 300 K . [R $\left[= 0.082\ dm^3\ atm\ K\ mol^{-1}\right]$

(A) 49.2 g mol^{-1} (B) 44.5 g mol^{-1}
(C) 54.2 g mol^{-1} (D) 56.4 g mol^{-1}

57. Identify thermoplastic polymer from following.

(A) Urea formaldehyde resin (B) Bakelite
(C) Polythene (D) Buna-N

58. Calculate radius of fourth orbit of B^{4+} ion.

(A) 169.3 pm (B) 211.6 pm
(C) 380.8 pm (D) 413.2 pm

59. Identify ' B ' in the following conversion.

$$CH_3 - I \xrightarrow{KCN} A \xrightarrow{Na/C_2H_5OH} B$$

(A) $CH_3 - CH_2 - CN$ (B) $CH_3 - CH_2 - CH_3$
(C) $CH_3 - NH - C_2H_5$ (D) $CH_3 - CH_2 - NH_2$

60. What is the number of lone pair of electrons on central halogen atom in BrF_3?

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

61. One mole of a gas occupying 3 L volume is expanded against a constant external pressure of 1 bar to a volume of 15 L . Calculate work done by the system

(A) 1.200×10^3 J (B) -2.43×10^3 J
(C) -1.200×10^3 J (D) 2.43×10^3 J

62. Calculate ΔT_f of aqueous 0.01 m formic acid if van't Hoff factor is 1.1

$\left[K_f = 1.86\ K\ Kg\ mol^{-1}\right]$

(A) 0.042 K (B) 0.020 K
(C) 0.011 K (D) 0.033 K

63. Which among the following is NOT allylic halide?

(A) $CH_2 = CH - CH_2 - X$
(B) $CH_3 - CH = CH - CH_2 - X$
(C) $CH_3 - CH_2 - CH = CH - CH_2 - X$
(D) $CH_3 - CH = CH - CH_2 - CH_2 - X$

64. Calculate the void volume of simple cubic unit cell if the volume of unit cell is $5.5 \times 10^{-22}\ cm^3$.

(A) $1.435 \times 10^{-22}\ cm^3$ (B) $1.761 \times 10^{-22}\ cm^3$
(C) $2.619 \times 10^{-22}\ cm^3$ (D) $3.880 \times 10^{-22}\ cm^3$

65. Calculate number of moles present in 9.10×10^{-2} kg of water.

(A) 0.9 (B) 1.8

(C) 3.0 (D) 5.0

66. Identify the product 'B' in the following reaction.

Toluene $\xrightarrow[CS_2]{\text{Chromylchloride}}$ A $\xrightarrow{H_3O^+}$ B

(A) Benzal chloride (B) Benzaldehyde

(C) Benzyl alcohol (D) Benzoic acid

67. Which from following properties of lanthanoids is NOT true?

(A) These are bad conductors of heat and electricity. (B) These are soft metals.

(C) Coordination number is usually greater than six. (D) These are strongly paramagnetic.

68. Which from the following defines enthalpy of a system?

(A) Ratio of pressure to volume (B) Product of pressure and volume

(C) Internal energy (U) + PV (D) Internal energy (U) - PV

69. Which from following salts is NOT derived from weak acid and weak base?

(A) Ammonium fluoride (B) Ammonium cyanide

(C) Ammonium acetate (D) Ammonium chloride

70. Which of the following is IUPAC name of hydroquinone?

(A) Benzene-1, 2-diol (B) Benzene-1, 3-diol

(C) Benzene-1, 4-diol (D) Benzene-1,3,5-triol

71. Calculate the number of atoms in 0.3 gram metal if it forms bec structure $\left[\rho \times a^3 = 3 \times 10^{-22}\ g\right]$

(A) 1.0×10^{21} (B) 2.0×10^{21}

(C) 3.0×10^{21} (D) 4.0×10^{21}

72. Identify the product ' Z ' in the following series of reactions.

Ethanol $\xrightarrow[\Delta]{SOCl_2}$ X $\xrightarrow[\text{Dryether}]{Mg}$ Y $\xrightarrow{NH_3}$ Z

(A) Ethylchloride (B) Ethyl magnesium chloride

(C) Ethyl amine (D) Ethane

73. Which of the following formula is used to calculate compressibility factor?

(A) $Z = \frac{PVT}{R}$ (B) $Z = \frac{nRT}{PV}$

(C) $Z = \frac{PV}{nRT}$ (D) $Z = (\frac{PV}{RT}) \times n$

74. Which among the following is a pair of monocarboxylic acids?

(A) Malonic acid and propionic acid (B) Valeric acid and succinic acid

(C) Acetic acid and adipic acid (D) Butyric acid and caproic acid

75. What is the half life of a first order reaction if time required to decrease concentration of reactant from 0.8 M to 0.2 M is 12 hour?

(A) 1.5 hour (B) 3 hour

(C) 6 hour (D) 12 hour

76. Which element from following has half filled If orbital at observed ground state?

(A) Gd (B) Sm

(C) Nd (D) Ho

77. What is the number of moles of nitrogen atoms present in one mole cytosine?

(A) 5 (B) 4

(C) 3 (D) 2

78. Which from following anions has lowest coagulating power for precipitation of positive sol?

(A) $[Fe(CN)_6]^{4-}$ (B) PO_4^{3-}

(C) SO_4^{2-} (D) Cl^-

79. Which of the following elements belongs to first group and fifth period of periodic table?

(A) Rubidium (B) Strontium

(C) Caesium (D) Barium

80. If E° cell for $Cd_{(s)} \left| Cd^{2+}_{(1M)} \square Ag^{+}_{(1M)} \right| Ag_{(s)}$ is 1.2 V . What is the emf of the cell at $25^\circ C$?

(A) -1.2 V (B) 2.4 V

(C) -2.4 V (D) 1.2 V

81. Identify a zero dimensional nano structure from following

(A) Nanorods (B) Nanoparticles
(C) Thin films (D) Fibres

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

Isopropylcyanide $\xrightarrow[H\mathrm{Cl}]{\mathrm{SnCl_2}}$ A $\xrightarrow{\mathrm{H_3O^+}}$ B + $\mathrm{NH_4Cl}$

(A) Propanal (B) Propanone
(C) 2-Methylpropanal (D) 2-Methylpropanoic acid

83. For the reaction $2\,\mathrm{N_2O_{5(g)}} \longrightarrow 4\mathrm{NO_{2(g)}} + \mathrm{O_{2(g)}}$ rate and rate constant are 1.02×10^{-4} mol $\mathrm{L^{-1}\,s^{-1}}$ and $3.4 \times 10^{-5}\ \mathrm{s^{-1}}$. What is the conc. of $\mathrm{N_2O_5}$?

(A) 1.7 mol $\mathrm{L^{-1}}$ (B) 3.0 mol $\mathrm{L^{-1}}$
(C) 3.4 mol $\mathrm{L^{-1}}$ (D) 5.1 mol $\mathrm{L^{-1}}$

84. Which from following ligands is able to form linkage isomers?

(A) Aqua (B) Ammine
(C) Iodo (D) Nitro

85. Identify the bond order and magnetic nature of $\mathrm{Li_2}$ molecule respectively.

(A) 1 and diamagnetic (B) 2 and diamagnetic
(C) 1 and paramagnetic (D) 2 and paramagnetic

86. What is the conductivity of 0.02 M $\mathrm{AgNO_3}$ solution having cell constant 1.1 $\mathrm{cm^{-1}}$ and resistance is 94.5 ohms?

(A) 0.0216 $\mathrm{ohm^{-1}\ cm^{-1}}$ (B) 0.0116 $\mathrm{ohm^{-1}\ cm^{-1}}$
(C) 0.0416 $\mathrm{ohm^{-1}\ cm^{-1}}$ (D) 0.0859 $\mathrm{ohm^{-1}\ cm^{-1}}$

87. What is the oxidation state of S in $\mathrm{SO_4^{2-}}$?

(A) +6 (B) −6
(C) +2 (D) +3

88. What is the general molecular formula of aldehydes?

(A) $\mathrm{C_nH_{2n+1}O}$ (B) $\mathrm{C_nH_{2n}O}$
(C) $\mathrm{C_nH_{2n+1}O_2}$ (D) $\mathrm{C_nH_{2n}O_2}$

89. Which among the following is NOT a pair of isomers?

(A) Butan-2-ol and 2-Methylpropanol (B) Butan-1-ol and 1-Methoxypropane
(C) 1-Methoxypropane and Ethoxyethane (D) Methoxyethane and Ethoxyethane

90. Identify the total number of complexes having bidentate ligands in them from following list of complexes.
a) Tetracyanonickelate(II) ion
b) Trioxalatocobaltate(III) ion
c) Sodium hexafluoroaluminate(III)
d) bis(ethylenediamine)dithiocyanatoplatinum(IV)

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

91. What is the relation between the vapour pressure of solution, vapour pressure of solvent and its mole fraction in the solution?

(A) $\mathrm{P_1 = P_1^{\circ} x_1}$ (B) $\mathrm{P_1^0 = P_1 x_1}$
(C) $\mathrm{P_1 = P_1^0 x_2}$ (D) $\mathrm{P_1^0 = P_1 x_2}$

92. Which of the following is obtained on oxidation of prop-1-ene with acidic $\mathrm{KMnO_4}$?

(A) Ethanoic acid (B) Propanoic acid
(C) Propanol (D) Propanone

93. Calculate the solubility product of sparingly soluble salt BA at 25°C if its solubility is 7.2×10^{-7} mol $\mathrm{dm^{-3}}$ at same temperature.

(A) 4.810×10^{-13} (B) 5.184×10^{-13}
(C) 6.454×10^{-13} (D) 5.925×10^{-13}

94. Which of the following expressions for conductivity of solution of an electrolyte is NOT correct?

(A) $\mathrm{k} = \frac{1}{\varpi}$ (B) $\mathrm{k} = \mathrm{G}\frac{l}{\mathrm{a}}$
(C) $\mathrm{k} = \frac{1}{\mathrm{R}}\frac{\mathrm{a}}{l}$ (D) $\mathrm{k} = \Lambda.\mathrm{c}$

95. What is the order of following reaction

$$2\mathrm{H_2O_{2(g)}} \longrightarrow 2\mathrm{H_2O_{(l)}} + \mathrm{O_{2(g)}}$$

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

96. Crotonyl alcohol is an example of

(A) Allylic alcohol (B) Benzylic alcohol
(C) Vinylic alcohol (D) Polyhydric alcohol

97. Identify basic amino acid from following.

(A) Tryptophan (B) Threonine
(C) Phenylalanine (D) Histidine

98. Which from following is a copolymer?

(A) Nylon 6 (B) Nylon 6,6
(C) Polythene (D) Buna -S

99. What is the total number of different types of unit cells present in triclinic crystal system?

(A) 1 (B) 2

(C) 3 (D) 4

100. Calculate the [OH] if pOH of solution is 4.94

(A) 2.356×10^{-5}M (B) 1.417×10^{-5}M

(C) 1.881×10^{-5}M (D) 1.148×10^{-5}M

101. The Solution set of the equation $\sin^2\theta - \cos\theta = \frac{1}{4}$ in the interval $[0, 2\pi]$ is

(A) $\{\frac{\pi}{6}, \frac{5\pi}{6}\}$ (B) $\{\frac{\pi}{3}, \frac{5\pi}{3}\}$

(C) $\{\frac{\pi}{3}, \frac{2\pi}{3}\}$ (D) $\{\frac{2\pi}{3}, \frac{4\pi}{3}\}$

102. If the points $(1, -1, \lambda)$ and $(-3, 0, 1)$ are equidistant from the plane $3x - 4y - 12z + 13 = 0$, then the sum of all possible values of λ is

(A) $\frac{7}{3}$ (B) $\frac{10}{3}$

(C) $\frac{4}{3}$ (D) $\frac{5}{3}$

103. If $\bar{a} = \hat{i} - 2\hat{j} + 3\hat{k}$ and $\bar{b} = 2\hat{i} + 3\hat{j} - \hat{k}$, then the angle between the vectors $(2\bar{a} + \bar{b})$ and $(\bar{a} + 2\,\bar{b})$ is

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{3}$

(C) $\frac{\pi}{4}$ (D) $\frac{\pi}{2}$

104. The maximum value of the objective function $z = 4x + 6y$ subject to $3x + 2y \leq 12, x + y \geq 4, x, y \geq 0$ is

(A) 24 (B) 46

(C) 56 (D) 36

105.

$$\frac{d}{dx}\left(\cos^{-1}\left(\frac{x - \frac{1}{x}}{x + \frac{1}{x}}\right)\right) =$$

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

(C) $\frac{-1}{1+x^2}$ (D) $\frac{-2}{1+x^2}$

106. If $\bar{a}, \bar{b}, \bar{c}$ are non-coplanar vectors and $\bar{p} = \frac{\bar{b}\times\bar{c}}{[\bar{a}\bar{b}\bar{c}]}, \bar{q} = \frac{\bar{c}\times\bar{a}}{[\bar{a}\bar{b}\bar{c}]}, \bar{r} = \frac{\bar{a}\times\bar{b}}{[\bar{a}\bar{b}\bar{c}]}$, then $2\bar{a}\cdot\bar{p} + \bar{b}\cdot\bar{q} + \bar{c}\cdot\bar{r} =$

(A) 0 (B) 3

(C) 4 (D) 1

107. The approximate value of $\tan^{-1}(0.999)$ is (use $\pi = 3.1415$)

(A) 0.7843 (B) 0.7849

(C) 0.7847 (D) 0.7851

108. Let P be a plane passing through the points $(2, 1, 0), (4, 1, 1)$ and $(5, 0, 1)$ and R be the point $(2, 1, 6)$. Then image of R in the plane P is

(A) $(6, 5, 2)$ (B) $(4, 3, 2)$

(C) $(6, 5, -2)$ (D) $(3, 4, -2)$

109. If $O(0, 0), A(1, 2)$ and $B(3, 4)$ are the vertices of triangle OAB , then the joint equation of the altitude and median drawn from O is

(A) $3x^2 - xy - 2y^2 = 0$ (B) $3x^2 + xy + 2y^2 = 0$

(C) $3x^2 - xy + 2y^2 = 0$ (D) $3x^2 + xy - 2y^2 = 0$

110. The equation of the plane, passing through the point $(-1, 2, -3)$ 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) $8x - 14y - 13z - 3 = 0$

(B) $8x - 14y + 13z + 75 = 0$

(C) $8x + 14y + 13z + 19 = 0$

(D) $8x + 14y - 13z - 59 = 0$

111. The incenter of the triangle ABC , whose vertices are $A(0, 2, 1), B(-2, 0, 0)$ and $C(-2, 0, 2)$ is

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

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

112. The combined equation of two lines through the origin and making an angle of 45° with the line $3x + y = 0$, is

(A) $2x^2 - 3xy - 2y^2 = 0$

(B) $2x^2 + 3xy + 4y^2 = 0$

(C) $2x^2 + 3xy - 2y^2 = 0$

(D) $2x^2 - 3xy + 2y^2 = 0$

113. The general solution of the differential equation $\frac{1}{x}\frac{dy}{dx} = \tan^{-1}$ is

(A) $y + \frac{x^2\tan^{-1}x}{2} + c = 0$, where c is a constant of integration.

(B) $y + x\tan^{-1}x + c = 0$, where c is a constant of integration.

(C) $y - x - \tan^{-1}x + c = 0$, where c is a constant of integration.

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

114. The area (in square units) in the first quadrant bounded by the curve $y = x^2 + 2$ and the lines $y = x + 1, x = 0$ and $x = 3$, is

(A) $\frac{15}{4}$ (B) $\frac{21}{2}$

(C) $\frac{17}{4}$ (D) $\frac{15}{2}$

115. The co-ordinates of the point where the line through $A(3, 4, 1)$ and $B(5, 1, 6)$ crosses the xy-plane are

(A) $(\frac{13}{5}, \frac{23}{5}, 0)$ (B) $(-\frac{13}{5}, \frac{23}{5}, 0)$

(C) $(\frac{13}{5}, -\frac{23}{5}, 0)$ (D) $(-\frac{13}{5}, -\frac{23}{5}, 0)$

116. The value of $\frac{\tan^{-1}(\sqrt{3}) - \sec^{-1}(-2)}{\operatorname{cosec}^{-1}(-\sqrt{2}) + \cos^{-1}(\frac{-1}{2})}$

(A) $\frac{4}{5}$ (B) $\frac{-4}{5}$

(C) $\frac{3}{5}$ (D) 0

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

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

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

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

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

118. If $(a + b)\cos C + (b + c)\cos A + (c + a)\cos B = 72$ and if $a = 18, b = 24$, then area of the triangle ABC is

(A) 144 sq.units (B) 216 sq.units

(C) 256 sq.units (D) 296 sq. units

119. If $\cot^{-1}(7) + \cot^{-1}(8) + \cot^{-1}(18) = \cot^{-1} x$, then the value of x is

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

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

120. If $P(X = 2) = 0.3, P(X = 3) = 0.4, P(X = 4) = 0.3$, then the variance of random variable X is

(A) 1.6 (B) 3.6

(C) 6.6 (D) 0.6

121. The Cartesian equation of a line is $2x - 2 = 3y + 1 = 6z - 2$, then the vector equation of the line is

(A) $\bar{r} = (\hat{i} - \frac{\hat{j}}{3} + \frac{\hat{k}}{3}) + \lambda(3\hat{i} + 2\hat{j} + \hat{k})$

(B) $\bar{r} = (-\hat{i} + \frac{\hat{j}}{3} - \frac{\hat{k}}{3}) + \lambda(\frac{1}{2}\hat{i} + \frac{1}{3}\hat{j} + \frac{1}{6}\hat{k})$

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

(D) $\bar{r} = (\hat{i} - \hat{j} + \hat{k}) + \lambda(\frac{1}{2}\hat{i} + \frac{1}{3}\hat{j} + \frac{1}{6}\hat{k})$

122. Let $\bar{a} = 2\hat{i} + \hat{j} - 2\hat{k}$ and $\bar{b} = \hat{i} + \hat{j}$. Let $\bar{c}$ be a vector such that $|\bar{c} - \bar{a}| = 3$ and $|(\bar{a} \times \bar{b}) \times \bar{c}| = 3$ and the angle between $\bar{c}$ and $\bar{a} \times \bar{b}$ is $30°$, then $\bar{a} \cdot \bar{c}$ is equal to

(A) $\frac{2\sqrt{2}}{3}$ (B) 5

(C) $-\frac{1}{8}$ (D) 2

123. If $\int \left(\frac{4e^x - 25}{2e^x - 5}\right) dx = Ax + B\log(2e^x - 5) + c$ (where c is a constant of integration) then

(A) $A = 5, B = 3$ (B) $A = 5, B = -3$

(C) $A = -5, B = 3$ (D) $A = -5, B = -3$

124. The converse of $[p \wedge (\sim q)] \to r$ is

(A) $\sim r \to (\sim p \vee q)$ (B) $r \to (\sim p \wedge \sim q)$

(C) $(\sim p \vee q) \to \sim r$ (D) $r \to (p \wedge \sim q)$

125. The differential equation obtained by eliminating arbitrary constant from the equation $y^2 = (x + c)^3$ is

(A) $(\frac{dy}{dx})^3 = 27y$ (B) $(\frac{dy}{dx})^3 = -27y$

(C) $8(\frac{dy}{dx})^3 = 27y$ (D) $8(\frac{dy}{dx})^3 + 27y = 0$

126. If the statements p, q and r have the truth values F, T, F respectively, then the truth values of the statement patterns $(p \wedge \sim q) \to r$ and $(p \vee q) \to r$ are respectively

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

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

127. The decay rate of radium is proportional to the amount present at any time t. If initially 60 gms was present and half life period of radium is 1600 years, then the amount of radium present after 3200 years is

(A) 20 grams (B) 15 grams

(C) 12 grams (D) 10 grams

128. If $\cos^{-1}x+\cos^{-1}y+\cos^{-1}z=3\pi$, then the value of $x^2+y^2+z^2-2xyz$ is

(A) 3 (B) 2

(C) 1 (D) 5

129. Let $A=\begin{bmatrix}1 & 2\\ -5 & 1\end{bmatrix}$ and $A^{-1}=xA+yI_2$, (where I_2 is unit matrix of order 2), then

(A) $x=\frac{-1}{11}, y=\frac{2}{11}$ (B) $x=\frac{1}{11}, y=\frac{-2}{11}$

(C) $x=\frac{-1}{11}, y=\frac{-2}{11}$ (D) $x=\frac{1}{11}, y=\frac{2}{11}$

130. If $f(x)=\frac{x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n-n}{x-1}$, for $x\neq 1$ is continuous at $x=1$, then $f(1)=$

(A) $\frac{n(n+1)(4n-1)}{6}$ (B) $\frac{n(n+1)}{2}$

(C) $\frac{n(n+1)(2n+1)}{6}$ (D) $\frac{n(2n+1)}{4}$

131. The particular solution of differential equation $\left(1+y^2\right)(1+\log x)dx+x\,dy=0$ at $x=1, y=1$ is

(A) $\log x-\frac{1}{2}(\log x)^2-\tan^{-1}y=-\frac{\pi}{4}$

(B) $\log x+\frac{1}{2}(\log x)^2+\tan^{-1}y=\frac{\pi}{4}$

(C) $\log x-\frac{1}{2}(\log x)^2+\tan^{-1}y=\frac{\pi}{4}$

(D) $\log x+\frac{1}{2}(\log x)^2-\tan^{-1}y=\frac{\pi}{4}$

132. If $\lim\limits_{x\to 1}\frac{x^2-ax+b}{x-1}=7$, then $a+b$ is equal to

(A) -1 (B) 1

(C) -11 (D) 11

133. A ladder 5 m long rests against a vertical wall. If its top slides downwards at the rate of 10 cm/sec., then the foot of the ladder is sliding at the rate of _____ m/sec., when it is 4 m away from the wall.

(A) 0.75 (B) 7.5

(C) 0.0075 (D) 0.075

134. If $f(x)=\frac{x}{2-x}$, $g(x)=\frac{x+1}{x+2}$, then (gogof) $(x)=$

(A) $\frac{6+x}{10-2x}$ (B) $\frac{6-x}{10+2x}$

(C) $\frac{6+x}{10+2x}$ (D) $\frac{6-x}{10-2x}$

135. If $f(x)=\cos^{-1}x$, $g(x)=e^x$ and $h(x)=g(f(x))$, then $\frac{h'(x)}{h(x)}=$

(A) $\frac{-1}{\sqrt{1-x^2}}$ (B) $\frac{-(e)^{(\cos^{-1}x)}}{\sqrt{1-x^2}}$

(C) $\frac{-1}{\sqrt{1-x^2}}e^x$ (D) $-\sqrt{1-x^2}$

136. Five persons A, B, C, D and E are seated in a circular arangement, if each of them is given a hat of one of the three colours red, blue and green, then the number of ways, of distributing the hats such that the person seated in adjacent seats get different coloured hats, is

(A) 30 (B) 15

(C) 60 (D) 40

137. The value of $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}}\frac{1}{\sin 2x(\tan^5 x+\cot^5 x)}dx$ is

(A) $\frac{1}{5}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{3\sqrt{3}}\right)\right)$ (B) $\frac{1}{2}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{9\sqrt{3}}\right)\right)$

(C) $\frac{1}{10}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{9\sqrt{3}}\right)\right)$ (D) $\frac{1}{10}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{3\sqrt{3}}\right)\right)$

138. If $\left|\frac{z}{1+i}\right|=2$, where $z=x+iy, i=\sqrt{-1}$ represents a circle, then centre ' C ' and radius ' r ' of the circle are

(A) $C\equiv(3,0), r=4$ (B) $C\equiv(6,0), r=2$

(C) $C\equiv(0,3), r=8$ (D) $C\equiv(0,0), r=2\sqrt{2}$

139. If $y=A\cos nx+B\sin nx$, then $\frac{d^2y}{dx^2}=$

(A) $-n^2y$ (B) n^2y

(C) n^2x (D) n^2x^2

140. A man and his wife appear for an interview for two posts. The probability of the husband's selection is $\frac{1}{7}$ and that of the wife's selection is $\frac{1}{5}$. If they appear for the interview independently, then the probability that only one of them is selected, is

(A) $\frac{1}{7}$ (B) $\frac{2}{7}$

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

141. The expected value of the sum of the two numbers obtained on the uppermost faces, when two fair dice are rolled, is

(A) 7 (B) 12

(C) 6 (D) 5

142.

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

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

(B) $\frac{\pi}{4}-\frac{x}{2}+c$, where c is a constant of integration.

(C) $\frac{\pi}{4}x-\frac{x^2}{4}+c$, where c is a constant of integration.

(D) $\frac{\pi}{4}x+\frac{x^2}{4}+c$, where c is a constant of integration.

143. The mean and variance of seven observations are 8 and 16 respectively. If 5 of the observations are $2, 4, 10, 12, 14$, then the square root of product of remaining two observations is

(A) $4\sqrt{3}$ (B) $3\sqrt{3}$

(C) $2\sqrt{3}$ (D) $5\sqrt{3}$

144. The equation of the tangent to the curve $y = 1 - e^{\frac{x}{3}}$ at the point of intersection with Y -axis is

(A) $x - 3y = 0$ (B) $x + 3y = 0$

(C) $x + 2y = 0$ (D) $3x + y = 0$

145.

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

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

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

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

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

146. The equation of the circle which passes through the centre of the circle $x^2 + y^2 + 8x + 10y - 7 = 0$ and concentric which the circle $2x^2 + 2y^2 - 8x - 12y - 9 = 0$ is

(A) $x^2 + y^2 - 4x - 6y + 77 = 0$

(B) $x^2 + y^2 - 4x - 6y - 89 = 0$

(C) $x^2 + y^2 - 4x - 6y + 97 = 0$

(D) $x^2 + y^2 - 4x - 6y - 87 = 0$

147. The acute angle between the lines $x\cos 30^\circ + y\sin 30^\circ = 3$ and $x\cos 60^\circ + y\sin 60^\circ = 5$ is

(A) 75° (B) 30°

(C) 60° (D) 45°

148. If $f(x) = \left(\sin^4 x + \cos^4 x\right), 0 < x < \frac{\pi}{2}$, then the function has minimum value at $x =$

(A) $0.7934, \frac{\pi}{9}$ (B) $\frac{1}{2}, \frac{\pi}{4}$

(C) $\frac{5}{8}, \frac{\pi}{3}$ (D) $0.75, \frac{\pi}{8}$

149. For an entry to a certain course, a candidate is given twenty problems to solve. If the probability that the candidate can solve any problem is $\frac{3}{7}$, then the probability that he is unable to solve at most two problem is

(A) $\frac{256}{49}(\frac{4}{7})^{18}$ (B) $\frac{1966}{49}(\frac{4}{7})^{18}$

(C) $\frac{1710}{49}(\frac{4}{7})^{18}$ (D) $\frac{1726}{49}(\frac{4}{7})^{18}$

150. If $A > B$ and $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then $\cot(A - B) =$

(A) $\frac{1}{y} - \frac{1}{x}$ (B) $\frac{1}{x} - \frac{1}{y}$

(C) $\frac{1}{x} + \frac{1}{y}$ (D) $\frac{xy}{x-y}$

- End of Question Paper -