MHT CET 2025 PCM Apr 23 Shift 1 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 2025**, 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. Which of the following statements is TRUE for n-type semiconductor?

(A) Holes are majority carriers and trivalent atoms are dopants.
(B) Electrons are majority carriers and trivalent atoms are dopants.
(C) Holes are minority carriers and pentavalent atoms are dopants.
(D) Electrons are minority carriers and pentavalent atoms are dopants.

2. When a current in the conducting coil is changed from 5 A in one direction to 5 A in opposite direction in 0.5 second, an average induced e.m.f in the coil is 2 V . The selfinductance of the coil is

(A) 25 mH
(B) 50 mH
(C) 75 mH
(D) 100 mH

3. The electric field intensity near a conducting surface having uniform surface charge density ' σ ' is given by (ε_0 = permittivity of free space)

(A) $\frac{\sigma}{\epsilon_0}$ and is parallel to the surface
(B) $\frac{2\sigma}{\epsilon_0}$ and is parallel to the surface
(C) $\frac{\sigma}{\epsilon_0}$ and is normal to the surface
(D) $\frac{2\sigma}{\epsilon_0}$ and is normal to the surface

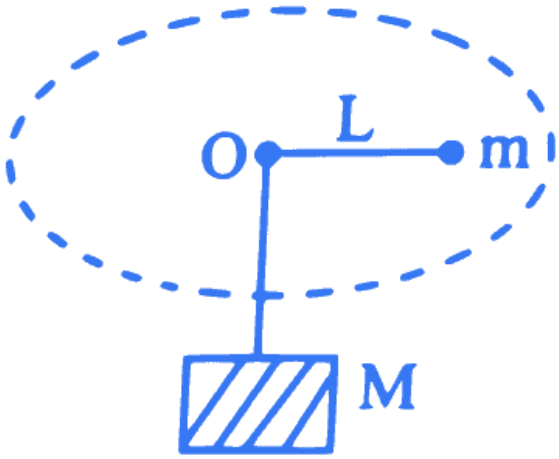
4. The excess pressure inside first soap bubble is three times that of a second soap bubble. The ratio of volumes of the first to second bubble

(A) 1 : 3
(B) 1 : 9
(C) 1 : 27
(D) 27 : 1

5. A particle performs S.H.M. of amplitude 'A' and wavelength ' λ ', Then the velocity of the wave (V) and the maximum particle velocity (v) are related as

(A) $v = \frac{\lambda V}{4\pi A}$
(B) $V = \frac{\lambda v}{4\pi A}$
(C) $v = \frac{2\pi A}{\lambda} V$
(D) $V = \frac{2\pi A}{\lambda} v$

6. The figure shows two masses ' m ' and ' M ' connected by a light string that passes through a small hole ' O ' at the centre of the table. Mass ' m ' is moved round in a horizontal circle with ' O ' as the centre. The frequency with which ' m ' should be revolved so that ' M ' remains stationary is (g = gravitational acceleration)



(A) $\frac{1}{\pi}\sqrt{\frac{\mathrm{ML}}{\mathrm{mg}}}$
(B) $\frac{1}{2\pi}\sqrt{\frac{\mathrm{Mg}}{\mathrm{mL}}}$
(C) $\frac{1}{\pi}\sqrt{\frac{\mathrm{Mg}}{\mathrm{mL}}}$
(D) $\frac{1}{2\pi}\sqrt{\frac{\mathrm{ML}}{\mathrm{mg}}}$

7. A regular hexagon of side 6 cm has a charge of 2μC at each of its vertices, what is the potential at the centre of the hexagon?

$$\left[\frac{1}{4\pi\varepsilon_0} = 9\times10^9 \text{ SI unit}\right]$$

(A) 1.5×10^5 V
(B) 1.8×10^6 V
(C) 2.4×10^5 V
(D) 3.2×10^6 V

8. For two different photosensitive materials having work function ϕ and 2ϕ respectively, are illuminated with light of sufficient energy to emit electrons. If the graph of stopping potential versus frequency is drawn, for these two different photosensitive materials, the ratio of slope of graph for these two materials is

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

9. The weight of man in a stationary lift is w_1 and when it is moving downwards with uniform acceleration ' a ' is w_2. If the ratio $w_1 : w_2 = 4 : 3$, then the value of ' a ' is (g = acceleration due to gravity)

(A) $\frac{g}{3}$ (B) $\frac{g}{4}$

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

10. The activity of radioactive sample is measured as N_0 counts per minute at time $t = 0$, and $\frac{N_0}{e}$ counts per minute at time $t = 3$ minute, The activity reduces to half its value in time (in minute)

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

(C) $3\log_{10} 2$ (D) $\frac{3}{\log_{10} 2}$

11. Two identical straight wires are stretched so as to produce 6 beats per second when vibrating simultaneously with tensions ' T_1 ' and ' T_2 ' respectively. On changing the tension slightly in one of them, the beat frequency remains unchanged. This will happen when (Given $\rightarrow T_1 > T_2$)

(A) T_1 is increased or T_2 is decreased (B) T_1 is increased by 144

(C) T_2 is decreased by 144 (D) T_1 is decreased or T_2 is increased

12. How much should the pressure be increased in order to reduce the volume of a given mass of gas by 5% at the constant temperature?

(A) 5% (B) 10%

(C) 5.26% (D) 4%

13. In Young's double slit experiment the wavelength of light used is 6000 $\mathring{A}$, the screen is 40 cm from the slits and the fringe width is 0.012 cm , the distance between two slits is

(A) 0.024 cm (B) 2.4 cm

(C) 0.24 cm (D) 0.2 cm

14. A square coil ABCD of side ' L ' is carrying a current in clockwise direction. A straight conductor carrying current I_2 (upward direction) is kept parallel to side AB at a distance $\frac{L}{3}$ in the plane of $ABCD$. The net force on the coil ABCD is (μ_0 = magnetic permeability)

(A) $\frac{\mu_0 I_1 I_2}{3\pi}$ (B) $\frac{3\mu_0 I_1 I_2}{4\pi}$

(C) $\frac{3\mu_0 I_1 I_2}{8\pi}$ (D) $\frac{9\mu_0 I_1 I_2}{8\pi}$

15. In a common emitter transistor amplifier circuit, the current gain $\alpha = 0.8$. If the base current changes by 3μ A then the collector current changes by

(A) 4μ A (B) 12μ A

(C) 6μ A (D) 24μ A

16. A ray of light is incident on first face of an equilateral glass prism at an angle of incidence ' I '. The emergent ray just grazes along the adjacent face. The refractive index of the the prism is $\sqrt{2}$. The value of angle of incidence at first face is $\left(\sin 45^\circ = \frac{1}{\sqrt{2}}, \sin 90^\circ = 1\right)$

(A) $\sin^{-1}(\sqrt{2}\sin 15^\circ)$ (B) $\sin^{-1}(\frac{\sin 30^\circ}{\sqrt{2}})$

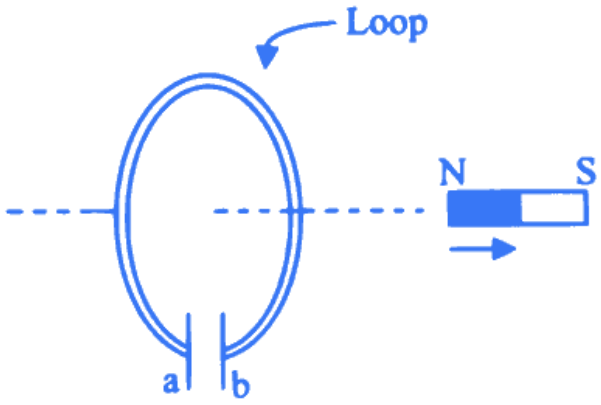
(C) $\cos^{-1}(\sqrt{2}\sin 20^\circ)$ (D) $\tan^{-1}\sqrt{2}\sin 15^\circ$

17. In hydrogen atom, the energy of electron in first and third orbit is ' E_1 ' and' E_3 ' respectively. If $E_3 = xE_1$ then the value of x will be

(A) $\frac{1}{9}$ (B) $\frac{1}{64}$

(C) $\frac{1}{27}$ (D) $\frac{1}{8}$

18. Figure shows the north pole of a magnet moving away from a thick conducting loop containing a capacitor. The excess positive charge will arrive on



(A) plate ' a ' (B) plate ' b '

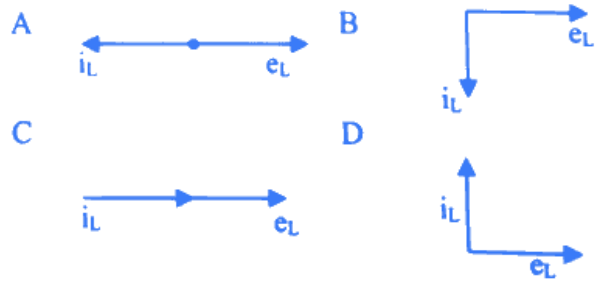
(C) both plates 'a' and 'b' (D) neither plate ' a ' nor plate ' b '

19. An observer moves towards a stationary source of sound with a velocity of one fifth of the velocity of sound. The percentage increase in the apparent frequency is

(A) 5% (B) 10%

(C) 20% (D) 25%

20. An a. c. source is connected across a pure inductor. Which one of the following figures shows the correct phase relation between the current and e.m.f.?



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

21. A disc of paper of radius ' R ' has a hole of radius ' r '. It is floating on a liquid of surface tension ' T '. The force of surface tension on the disc is

(A) $2\pi\ \mathrm{T(R-r)}$ (B) $2\pi\ \mathrm{T(R+r)}$
(C) $3\pi\mathrm{TR}$ (D) $4\pi\ \mathrm{T(R+r)}$

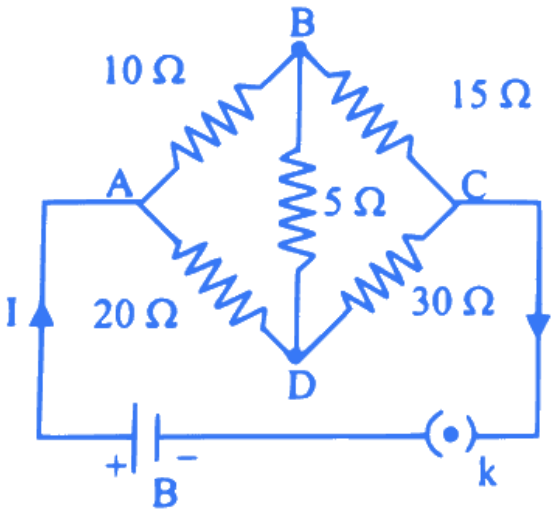
22. Two tuning forks when sounded together produce 4 beats per second. One of the forks is in unison with 23 cm length of sonometer wire and other with 24 cm length of the same wire. The frequencies of the two tuning forks are

(A) 96 Hz, 92 Hz (B) 92 Hz, 88 Hz
(C) 72 Hz, 68 Hz (D) 48 Hz, 44 Hz

23. Let the speed of light and the polarising angle for a given medium be ' V ' and ' i_p ' respectively. The relation between them is : (C = speed of light in vacuum)

(A) $\mathrm{V=Ccos(i_p)}$ (B) $V\cos(i_p)=C\sin(i_p)$
(C) $\mathrm{C=Vcot(i_p)}$ (D) $\mathrm{Vsin(i_p)=Ccos(i_p)}$

24. The equivalent resistance of the following circuit when no current flows in the resistance of 5Ω is nearly



(A) 13Ω (B) 17Ω
(C) 19Ω (D) 21Ω

25. In the case of common emitter transistor amplifier, the ratio of collector current to emitter current is 0.96 , then the current gain (β) of the amplifier is

(A) 6 (B) 48
(C) 24 (D) 12

26. Which of the following comes under the category of random errors?

(A) Improper calibration of thermometer
(B) Zero error of 1μ V in voltmeter
(C) Student measures 22°, where as the correct angle is 20°
(D) Errors resulting from the fluctuations in electric power supply

27. The energy that should be added to an electron to reduce its de-Broglie wavelength from λ to $\frac{\lambda}{2}$ is n times the initial energy. The value of ' n ' is

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

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28. In an a.c. circuit with pure capacitance ' C ' and a.c. source $E = E_0 \sin \omega t$, the equation of instantaneous current is given by

(A) $\mathrm{I} = \mathrm{E_0 \omega c \sin(\omega t)}$

(B) $I = E_0 \omega c \sin(\omega t + \frac{\pi}{2})$

(C) $\mathrm{I} = \frac{\mathrm{E_0}}{\omega \mathrm{c}} \sin(\omega \mathrm{t})$

(D) $\mathrm{I} = \frac{\mathrm{E_0}}{\omega \mathrm{c}} \sin(\omega \mathrm{t} + \frac{\pi}{2})$

29. Radius of curved road is ' R ', width of road is ' b '. The outer edge of road is raised by ' h ' with respect to inner edge so that a car with velocity ' V ' can pass safe over it, then value of ' h ' is (g = acceleration due to gravity)

(A) $\frac{\mathrm{V^2\, b}}{\mathrm{Rg}}$ (B) $\frac{\mathrm{V}}{\mathrm{Rgb}}$

(C) $\frac{V^2 R}{g}$ (D) $\frac{V^2 b}{g}$

30. A polyatomic gas is compressed to $\left(\frac{1}{8}\right)^{\text{th}}$ of its volume adiabatically. If its initial pressure is $\mathrm{P_0}$, its new pressure will be [Given, $\frac{\mathrm{C_p}}{\mathrm{C_v}} = \frac{4}{3}$]

(A) $6\mathrm{P_0}$ (B) $2\mathrm{P_0}$

(C) $8\mathrm{P_0}$ (D) $16\mathrm{P_0}$

31. A particle is executing linear S.H.M. starting from mean position. The ratio of the kinetic energy to the potential energy of the particle at a point of half the amplitude is

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

(C) 4 : 1 (D) 8 : 1

32. A parallel plate air capacitor has capacity ' C ' and distance of separation between plates is ' d '. If a conducting sheet of thickness $\frac{2d}{3}$ is inserted in between the plates, the capacitance becomes C_1. The ratio of $\frac{C_1}{C}$ is

(A) 2 : 1 (B) 4 : 1

(C) 3 : 1 (D) 5 : 1

33. A uniform solid sphere of mass ' m ' and radius ' r ' is surrounded by a uniform thin spherical shell of radius ' $2r$ ' and mass ' m ' then the gravitational field

(A) at a distance of 15 r from the centre is $\frac{2}{9}\frac{\mathrm{Gm}}{\mathrm{r^2}}$

(B) at a distance of (2.5)r from the centre is $\frac{8}{25}\frac{\mathrm{Gm}}{\mathrm{r^2}}$

(C) at a distance of (1.5)r from the centre is zero.

(D) between the sphere and spherical shell is uniform.

34. A current of 5 A is flowing at 220 V in a primary coil of a transformer. If the voltage produced in the secondary coil is 2200 V and 50% of power is lost, then the current in the secondary coil will be

(A) 2.5 A (B) 5 A

(C) 0.25 A (D) 0.025 A

35. The magnetic field at the centre of a current carrying circular coil of area ' A ' is ' B '. The magnetic moment (M) of the coil is (μ_0 = permeability of free space)

(A) $\frac{\mathrm{BA^2}}{\mu_0 \pi}$ (B) $\frac{2BA^{3/2}}{\mu_0 \sqrt{\pi}}$

(C) $\frac{BA^{3/2}}{\mu_0 \pi}$ (D) $\frac{\mu_0 \sqrt{\pi}}{\mathrm{BA^{3/2}}}$

36. A pipe open at both ends produces a fundamental frequency n_1. When the pipe is kept with $\frac{3^{\text{th}}}{4}$ of its length in water, it produces a note of fundamental frequency $\mathrm{n_2}$. The ratio of $\frac{\mathrm{n_1}}{\mathrm{n_2}}$ is

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

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

37. A wind with speed 50 m/s blows parallel to the roof of a house. The area of the roof is 300 $\mathrm{m^2}$. Assume that the pressure inside the house is atmospheric pressure. Density of air is 1.2 $\mathrm{kg/m^3}$. The magnitude of the force exerted by the wind on the roof will be

(A) 1.5×10^5 N (B) 3.0×10^5 N

(C) 4.5×10^5 N (D) 9.0×10^5 N

38. The pressure ' P ', volume ' V ' and temperature ' T ' of a gas in a jar ' A ' and the gas in other jar ' B ' is at pressure ' 2 P ', volume ' $\frac{V}{4}$ ' and temperature ' $\frac{T}{4}$ '. Then the ratio of the number of molecules in jar A and jar B will be

(A) 1 : 1 (B) 1 : 2

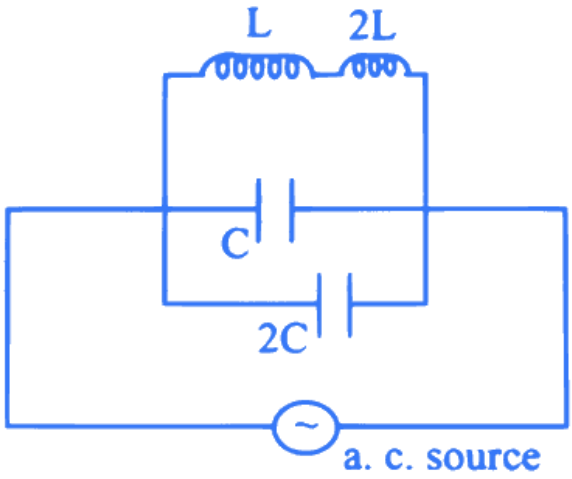
(C) 2 : 1 (D) 4 : 1

39. Let the current ' I ' be associated with an electron of charge ' e ' moving in a circular orbit of radius ' r ' with speed ' v ' around the positively charged nucleus. The ratio $\frac{r}{v}$ is

(A) $\frac{\mathrm{eI}}{2\pi}$ (B) $\frac{2\pi}{\mathrm{eI}}$

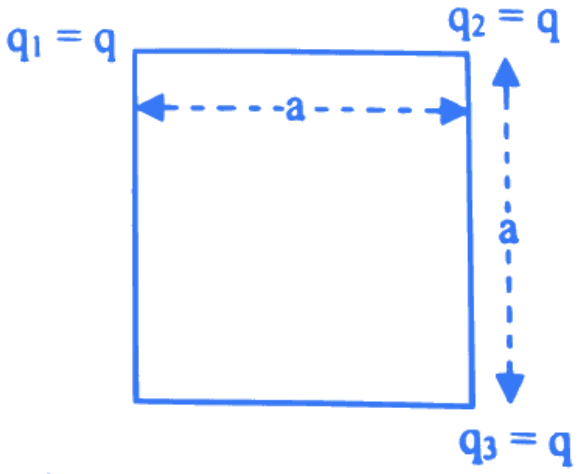
(C) $\frac{\mathrm{e}}{2\pi \mathrm{I}}$ (D) $\frac{2e\mathrm{I}}{\pi}$

40. Figure shows the combination of inductances and capacitances. Resonant frequency of the L – C circuit is



(A) $\frac{1}{2\pi\sqrt{LC}}$ (B) $\frac{1}{3\pi\sqrt{LC}}$
(C) $\frac{1}{4\pi\sqrt{LC}}$ (D) $\frac{1}{6\pi\sqrt{LC}}$.

41. Three equal charges are placed on the three corners of a square as shown below. If the magnitude of force between ' q_1 ' and ' q_2 ' is ' F_{12} ' and that between ' q_1 ' and ' q_3 ' is F_{13}, then the ratio of F_{13} to F_{12} is

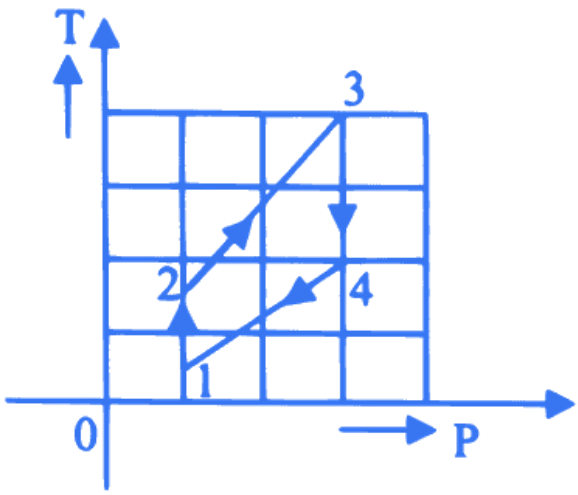


(A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$
(C) $\frac{1}{2}$ (D) 2

42. Two bodies of mass 10 kg and 5 kg are moving in concentric circular orbits of radii ' R ' and ' r ' respectively such that their periods are same. The ratio between their centripetal acceleration is

(A) R/r (B) r/R
(C) R^2/r^2 (D) r^2/R^2

43. Two moles of an ideal monoatomic gas undergo a cyclic process as shown in figure. The temperatures in different states are given as $6\ T_1 = 3\ T_2 = 2\ T_4 = T_3 = 2400$ K. The work done by the gas during the complete cycle is (R = Universal gas constant)

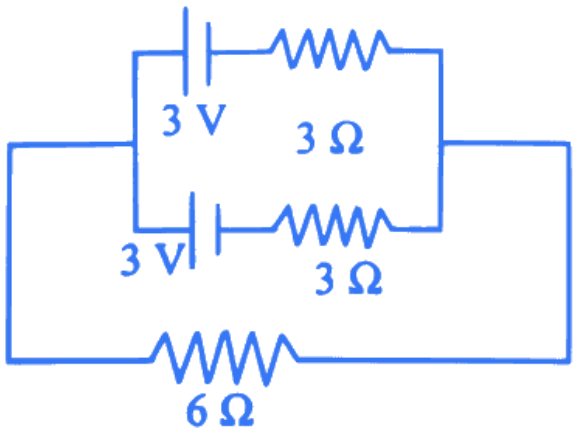


(A) -1600 R (B) 1600 R
(C) -1200 R (D) 800 R

44. The amplitude of a damped oscillator becomes $\left(\frac{1}{3}\right)^{rd}$ of original amplitude in 2 seconds. If its amplitude after 6 second become $\left(\frac{1}{n}\right)$ times the original amplitude, the value of n is (n is non zero integer)

(A) 9 (B) 3
(C) 81 (D) 27

45. In the following circuit, the current through 6Ω resistor is



(A) $\frac{1}{5}$ A (B) $\frac{2}{5}$ A
(C) $\frac{1}{4}$ A (D) $\frac{3}{4}$ A

46. If $\vec{P} = b\hat{i} + 6\hat{j} + \hat{k}$ and $\vec{Q} = \hat{i} - a\hat{j} + 4\hat{k}$ are perpendicular to each other, also $3\,b - a = 5$. The value of a and b is

(A) $a = 2,\ b = 10$ (B) $a = 1,\ b = 2$

(C) $a = 2,\ b = 3$ (D) $a = 4,\ b = 3$

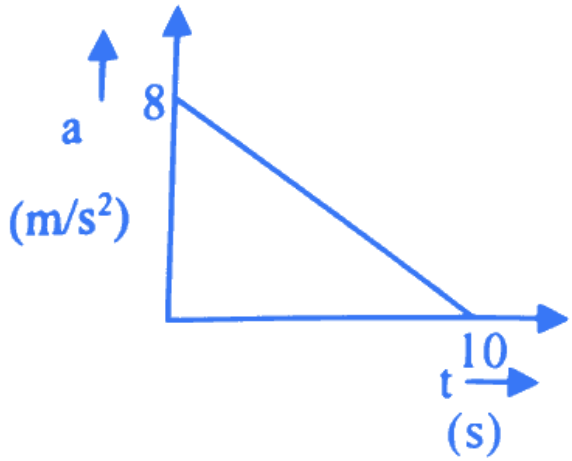
47. Two polaroids are oriented with their planes perpendicular to incident light and transmission axis making an angle 30° with each other. What fraction of incident unpolarised light is transmitted?

$$\left(\cos 30^\circ = \sqrt{3}\ /2\right)$$

(A) 57.5% (B) 17.5%

(C) 27.5% (D) 37.5%

48. The acceleration (a) - time (T) graph for the body starting from rest is given below. The maximum speed of the body is



(A) 40 m/s (B) 80 m/s

(C) 160 m/s (D) 200 m/s

49. Two spherical black bodies have radii ' R_1 ' and ' R_2 '. Their surface temperatures are $T_1 K$ and $T_2 K$ respectively. If they radiate the same power, the ratio $\frac{R_1}{R_2}$ is

(A) $(\frac{T_1}{T_2})^4$ (B) $(\frac{T_1}{T_2})^2$

(C) $(\frac{T_2}{T_1})^4$ (D) $(\frac{T_2}{T_1})^2$

50. A thermometer bulb has volume $10^{-6}\ m^3$ and cross-section of the stem is $0.002\ cm^2$. The bulb is filled with mercury at $0^\circ C$. If the thermometer reads temperature as $100^\circ C$, then the length of mercury column is (coefficient of cubical expansion of mercury $= 18 \times 10^{-5}/^\circ C$)

(A) 90 cm (B) 9 mm

(C) 9 cm (D) 0.9 mm

51. Which among the following salts forms basic solution in water?

(A) NH_4NO_3 (B) NH_4Cl

(C) Na_2CO_3 (D) Na_2SO_4

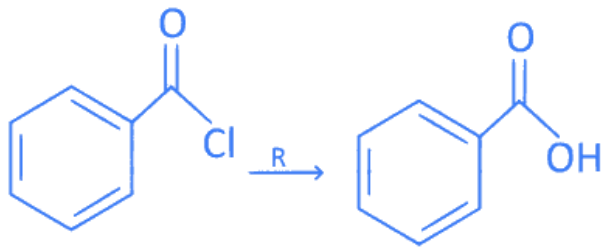
52. Identify product ' B ' in the following sequence of reactions.

$$\text{1,2-Dibromoethane} \xrightarrow[\text{alcohol}]{\text{KOH}} A \xrightarrow{\text{sodamide}} B$$

(A) Bromoethane (B) Bromoethene

(C) Ethene (D) Ethyne

53. Identify the reagent R necessary to bring the following conversion.



(A) H_2O (B) CrO_3

(C) dil. NaOH (D) $KMnO_4$

54. Which from following reactions is exothermic?

(A) $KOH_{(aq)} + HNO_{3(aq)} \longrightarrow KNO_{3(aq)} + H_2O$

(B) $H_2O_{(s)} \longrightarrow H_2O_{(l)}$

(C) $NaCl_{(s)} + aq \longrightarrow Na^+_{(aq)} + Cl^-_{(aq)}$

(D) $N_{2(g)} + 2O_{2(g)} \longrightarrow 2NO_{2(g)}$

55. Calculate the number of atoms in 1 g metal if it forms fcc crystal structure. $\left[\rho \times a^3 = 1.728 \times 10^{-22}\ g\right]$

(A) 2.315×10^{22} (B) 3.156×10^{22}

(C) 4.108×10^{22} (D) 1.452×10^{22}

56. Which among the following ligands has highest field strength?

(A) H_2O (B) OH^-

(C) $C_2O_4^{2-}$ (D) CO

57. What is the number of moles of hydrogen atoms required to reduce one mole of nitroethane completely using Sn and HCl ?

(A) 2 (B) 3

(C) 4 (D) 6

58. Find the rate of following reaction.

$$2\,N_2O_{5(g)} \longrightarrow 4NO_{2(g)} + O_{2(g)}$$

if concentration of NO_2 increases to 5.2×10^{-3}M in 100 seconds.

(A) 1.3×10^{-3} moldm^{-3} s^{-1}

(B) 1.3×10^{-5} moldm^{-3} s^{-1}

(C) 4.0×10^{-5} moldm^{-3} s^{-1}

(D) 5.2×10^{-5} moldm^{-3} s^{-1}

59. Identify correct statement for reaction stated below.

$$Ag_2O + H_2O + 2e^- \longrightarrow 2Ag + 2OH^-$$

(A) Water is oxidised. (B) Hydrogen is oxidised.

(C) Silver is reduced. (D) Hydrogen is reduced.

60. Which of the following inert gases is used for magnetic resonance imaging?

(A) He (B) Ne

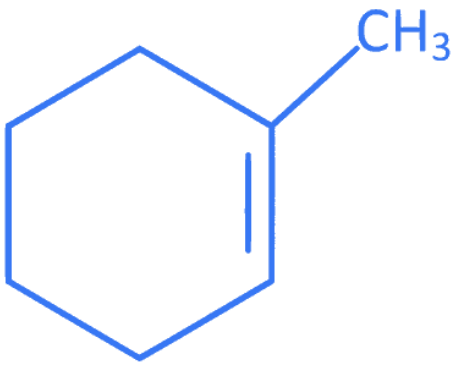
(C) Ar (D) Xe

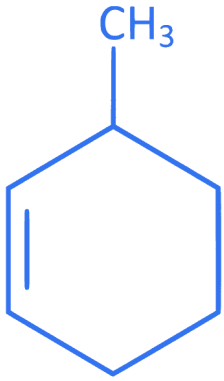
61. A weak base is 5% dissociated in its 0.01 M solution. Calculate the dissociation constant.

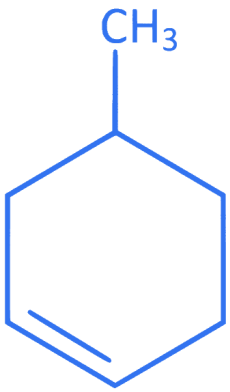
(A) 3.5×10^{-6} (B) 2.0×10^{-5}

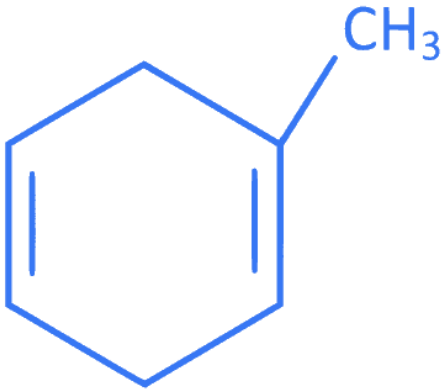
(C) 2.3×10^{-4} (D) 2.5×10^{-5}

62. Which of the following compounds forms 1-bromo-1-methylcyclohexane when treated with HBr ?

(A) 

(B) 

(C) 

(D) 

63. Identify substrate ' S ' in the following reaction.

$$S \xrightarrow{\text{Dimethylcadmium}} \text{Propanone} + \text{Cadmium chloride}$$

(A) Ethyl chloride
(B) Ethylene dichloride
(C) Ethanoyl chloride
(D) Ethylidene dichloride

64. Calculate work done in isothermal reversible expansion of 1 mole ideal gas from initial pressure 10 bar to final pressure 1 bar at 300 K . $\left(\mathrm{R} = 8.314\ \mathrm{J\ K^{-1}\ mol^{-1}}\right)$.

(A) -2.87 kJ
(B) -8.60 kJ
(C) -5.74 kJ
(D) -11.49 kJ

65. Calculate the volume occupied by all particles in bcc unit cell if the volume of unit cell is $8.0 \times 10^{-23}\ \mathrm{cm^3}$.

(A) $3.19 \times 10^{-23}\ \mathrm{cm^3}$
(B) $2.72 \times 10^{-23}\ \mathrm{cm^3}$
(C) $5.44 \times 10^{-23}\ \mathrm{cm^3}$
(D) $1.48 \times 10^{-23}\ \mathrm{cm^3}$

66. What is EAN of metal ion in hexacyanoferrate (II) ion?

(A) 36
(B) 38
(C) 37
(D) 35

67. What is the total number of -OH groups present in ribonucleoside?

(A) 5
(B) 4
(C) 3
(D) 2

68. The rate constant of a first order reaction is $1.15 \times 10^{-3}\ \mathrm{s^{-1}}$. How long will 5 g of reactant take to reduce to 3 g ?

(A) 314 seconds
(B) 240 seconds
(C) 404 seconds
(D) 444 seconds

69. Identify the element forming peroxide on reaction with oxygen.

(A) C
(B) Ar
(C) Na
(D) He

70. Consider galvanic cell, $^{\ominus}A_{(s)} \left| A^{+2}_{(aq)} \right| \left| B^{+}_{(aq)} \right| B^{\oplus}_{(s)}$ if emf of cell is positive, identify a correct cell reaction from following.

(A) $A_{(s)} + B^{+2}_{(aq)} \longrightarrow A^{+2}_{(aq)} + B_{(s)}$

(B) $A_{(s)} + 2\,B^{+}_{(aq)} \longrightarrow A^{+2}_{(aq)} + 2\,B_{(s)}$

(C) $2\,A^{+2}_{(aq)} + B_{(s)} \longrightarrow 2\,A_{(s)} + B^{+}_{(aq)}$

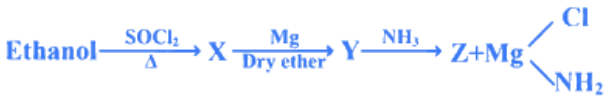
(D) $2\,A_{(s)} + B^{+}_{(aq)} \longrightarrow 2\,A^{+2}_{(aq)} + B_{(s)}$

71. Solubility of binary sparingly soluble salt is $1.12 \times 10^{-4}\ g/dm^3$. Calculate its solubility product (molar mass of salt $= 112\ g\ mol^{-1}$)

(A) 1×10^{-3} (B) 1×10^{-6}

(C) 1×10^{-9} (D) 1×10^{-12}

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



(A) Ethyl chloride (B) Ethyl magnesium chloride

(C) Ethyl amine (D) Ethane

73. Which of the following has highest solubility in water?

(A) Phenol (B) p-Cresol

(C) o-Nitrophenol (D) p-Nitrophenol

74. Calculate the standard enthalpy change for reaction,

$$C_2H_5OH_{(l)} + 3O_{2(g)} \longrightarrow 2CO_{2(g)} + 3H_2O_{(l)}$$

if $\Delta_f H^{\circ}(C_2H_5OH) = -280\ kJ\ mol^{-1}$

$\Delta_f H^{\circ}(CO_2) = -390\ kJ\ mol^{-1}$

$\Delta_f H^{\circ}(H_2O) = -285\ kJ\ mol^{-1}$

(A) -678.00 kJ (B) -2033.00 kJ

(C) -1355.00 kJ (D) $-1016.00 Kj$

75. Determine the expected value of ΔT_f for $1\ m CaCl_2$ solution if 1 m urea solution has ΔT_f value ' x ' K .

(A) x K (B) $2x$ K

(C) $3x$ K (D) $\frac{x}{2}$ K

76. What is the medicinal property of Eugenol?

(A) Antiseptic (B) Antioxidant

(C) Analgesic and antimicrobial (D) Antidiabetic

77. What type of glycosidic linkages are present in cellulose?

(A) $\alpha - 1,4$ (B) $\beta - 1,4$

(C) $\alpha - 1,6$ (D) $\beta - 1,6$

78. Find the value of spin only magnetic moment for Zn^{2+} in BM.

(A) 1.73 (B) 2.84

(C) 0.0 (D) 3.87

79. Which from following is classified multimolecular colloid?

(A) Starch (B) Cellulose

(C) S_8 sulphur molecules (D) Plastics

80. Standard potential of electrode reaction $Cu^{+2}_{(aq)} + 2e^{-} \longrightarrow Cu_{(s)}$ is $+0.34$ V .
What is standard potential of reaction

$$2Cu_{(s)} \longrightarrow 2Cu^{+2}_{(aq)} + 4e^{-}\ ?$$

(A) +0.68 V (B) -0.68 V

(C) +0.34 V (D) -0.34 V

81. A container contains equal masses of H_2, He, CO_2 and Ne at a certain temperature. Which of the following gas exerts maximum partial pressure?

(A) H_2 (B) He

(C) CO_2 (D) Ne

82. The reaction of aryl halide with sodium metal in dry ether to give biphenyl is known as

(A) Swartz reaction (B) Wurtz reaction

(C) Fittig reaction (D) Wurtz-Fittig reaction

83. Identify the final product obtained when a mixture of vapours of phenol and hydrogen is passed over nickel catalyst at 433 K .

(A) Cyclohexanol (B) Cyclohex-2-en-1-ol

(C) Cyclohexane (D) Benzene

84. What is the numerical value of angular momentum for an electron in first orbit of hydrogen atom? ($h = 6.626 \times 10^{-34} Js$)

(A) 1.05×10^{-34} (B) 2.10×10^{-34}

(C) 3.16×10^{-34} (D) 4.22×10^{-34}

85. Calculate van't Hoff factor of aqueous solution of 0.18 m electrolyte that freezes at $-0.54^{\circ}C$. (K_f for solvent $= 1.86$ K kg mol^{-1})

(A) 1.126 (B) 2.449
(C) 1.612 (D) 2.150

86. What is the molar mass of third homologue of alkane series?

(A) 40 g mol^{-1} (B) 58 g mol^{-1}
(C) 44 g mol^{-1} (D) 46 g mol^{-1}

87. Which from following polymers is used to obtain oil seals?

(A) Teflon (B) Dacron
(C) Nylon 6 (D) LDP

88. Which element from following has largest ionic size in +3 state?

(A) Pr (B) Sm
(C) La (D) Yb

89. Identify the principle suggesting to avoid protection and deprotection of selective group for organic reactions in green chemistry.

(A) Reduce derivatives (B) Use of renewable feedstock
(C) Design for energy efficiency (D) Designing safer chemicals

90. What is value of E_{cell} at 298 K for the reaction, $Zn_{(s)} + Cu^{+2}(0.1M) \longrightarrow Zn^{+2}(0.1M) + Cu_{(s)}$ if $E^{\circ}_{cell} = 1.1$ V ?

(A) 1.1 V (B) 0.11 V
(C) 1.0408 V (D) 0.0296 V

91. Which of the following compounds has high lattice enthalpy?

(A) LiCl (B) NaCl
(C) BeF_2 (D) $CaCl_2$

92. Which among the following is a pair of functional isomers?

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

93. Which among the following compounds has highest boiling point?

(A) Propanal (B) Ethanal
(C) Pentanal (D) Hexanal

94. Calculate the molality of solution of non-volatile solute if boiling point elevation is 1.75 K . [K_b for solvent $= 3$ K kg mol^{-1}]

(A) 0.480 m (B) 0.33 m
(C) 0.58 m (D) 0.63 m

95. Which from following pair of compounds exhibits isomorphism?

(A) Calcite and aragonite (B) α-quartz and cristobalite
(C) Sodium nitrate and calcium carbonate (D) Diamond and fullerene

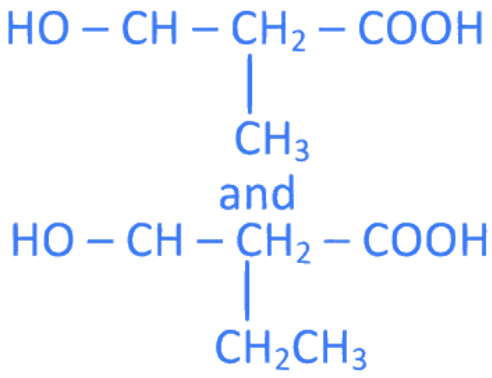
96. What are the monomers used in preparation of PHBV?

(A) $HOOC - (CH_2)_4 - COOH$ and $H_2N - (CH_2)_6 - NH_2$

(B) $HO - (CH_2)_2 - OH$ and



(C)



(D) C_6H_5OH and CH_2O

97. Which from following is a correct increasing order of basic strength of compounds?

(A) $(CH_3)_2NH < CH_3NH_2 < (CH_3)_3N < NH_3$
(B) $NH_3 < (CH_3)_2NH < CH_3NH_2 < (CH_3)_3N$
(C) $CH_3NH_2 < (CH_3)_2NH < (CH_3)_3N < NH_3$
(D) $NH_3 < (CH_3)_3N < CH_3NH_2 < (CH_3)_2NH$

98. Which of the following is an example of first order reaction?

(A) $CH_3CHO_{(g)} \longrightarrow CH_{4(g)} + CO_{(g)}$

(B) $2NO_{2(g)} + F_{2(g)} \longrightarrow 2NO_2F_{(g)}$

(C) $2NO_{(g)} + 2H_{2(g)} \longrightarrow N_{2(g)} + 2H_2O_{(g)}$

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

99. What is the number of moles present in 1 m^3 of any gas at STP?

(A) 32.4 (B) 54.6

(C) 44.6 (D) 28.2

100. Identify from following compounds where valence shell of 'Xe' consists one lone pair of electrons.

(A) XeF_2 (B) XeF_4

(C) $XeOF_2$ (D) $XeOF_4$

101. A fair coin is tossed 100 times. The chance of getting a head even number of times is

(A) $\frac{1}{8}$ (B) $\frac{3}{8}$

(C) $\frac{1}{2}$ (D) $\frac{3}{4}$

102. Let $\overline{a}, \overline{b}, \overline{c}, \overline{d}$ are vectors such that $\overline{a} \times \overline{b} = 2\hat{i} + 3\hat{j} - \hat{k}$ and $\overline{c} \times \overline{d} = 3\hat{i} + 2\hat{j} + \lambda\hat{k}$ and if $\begin{vmatrix} \overline{a} \cdot \overline{c} & \overline{b} \cdot \overline{c} \\ \overline{a} \cdot \overline{d} & \overline{b} \cdot \overline{d} \end{vmatrix} = 0$, then $\lambda =$

(A) 6 (B) -6

(C) 12 (D) -12

103. In $\triangle ABC$, with usual notations, if $\cos\frac{B}{2} = \sqrt{\frac{c+a}{2a}}$, then $a^2 =$

(A) $b^2 - c^2$ (B) $b + c$

(C) $b^2 + c^2$ (D) $b - c$

104. The joint equation of two lines passing through $(-2, 3)$ and parallel to the bisectors of the angle between the co-ordinate axes is

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

(B) $x^2 + y^2 + 4x + 6y - 5 = 0$

(C) $x^2 - y^2 + 4x + 6y - 5 = 0$

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

105. Let the circle with centre at origin pass through the vertices of an equilateral triangle ABC . If $A \equiv (2, 4)$, then the length of the median through A is

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

(C) $4\sqrt{5}$ units (D) $6\sqrt{5}$ units

106. Let $\bar{a} = \hat{i} + \hat{j} + \hat{k}, \bar{b}$ and $\bar{c} = \hat{j} - \hat{k}$ be three vectors such that $\overline{a} \times \overline{b} = \overline{c}$ and $\overline{a} \cdot \overline{c} = 0$. If the length of projection vector of the vector $\overline{b}$ on the vector $\overline{a} \times \overline{c}$ is l, then the value of $3l^2$ is

(A) 1 (B) 2

(C) 4 (D) 6

107. The distance of the point $(1, 2)$ from the line $x + y = 0$ measured parallel to the line $3x - y = 2$ is

(A) $\frac{3\sqrt{2}}{8}$ units (B) $\frac{3\sqrt{10}}{4}$ units

(C) 10 units (D) $5\sqrt{5}$ units

108.

$$\lim_{x \to 2} \frac{x + 3x^2 + 5x^3 + 7x^4 - 166}{x - 2} =$$

(A) 267 (B) 167

(C) 287 (D) 297

109. If $f(x) = \frac{10^x + 7^x - 14^x - 5^x}{1 - \cos x}, x \neq 0$ is continuous at $x = 0$, then the value of $f(0)$ is

(A) $\log 2[\log(\frac{5}{7})]$ (B) $\log 4[\log(\frac{5}{7})]$

(C) $\log 2[\log(\frac{7}{5})]$ (D) $\log 4[\log(\frac{7}{5})]$

110.

If A and B are non-singular matrices of order 2 such that $(AB)^{-1} = \frac{1}{6}\begin{bmatrix} -7 & -3 \\ 2 & 3 \end{bmatrix}$ and $A^{-1} = \frac{1}{3}\begin{bmatrix} 4 & 3 \\ -1 & 0 \end{bmatrix}$ then $B^{-1} =$

(A) $\frac{1}{2}\begin{bmatrix} 2 & 3 \\ 1 & -1 \end{bmatrix}$ (B) $\frac{1}{2}\begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$

(C) $\frac{1}{2}\begin{bmatrix} -1 & 3 \\ 1 & 2 \end{bmatrix}$ (D) $\frac{1}{6}\begin{bmatrix} 1 & 1 \\ 2 & 3 \end{bmatrix}$

111. If $\sin A + \sin B = x$ and $\cos A + \cos B = y$, then $\sin(A + B) =$

(A) $\frac{2xy}{x^2+y^2}$ (B) $\frac{xy}{x^2+y^2}$

(C) $\frac{2xy}{y^2-x^2}$ (D) $\frac{xy}{y^2-x^2}$

112. Let mean and standard deviation of probability distribution

$X = x$	-3	0	1	α
$P(X = x)$	$\frac{1}{4}$	K	$\frac{1}{4}$	$\frac{1}{3}$

be μ and σ respectively and if $\sigma - \mu = 2$ then $\sigma =$

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

(C) $\frac{7}{2}$ (D) $\frac{9}{2}$

113. In a game a man wins *Rs* 40 if he gets 5 or 6 on a throw of a fair die and loses ₹ 20 for getting any other number on the die. If he decides to throw the die either till he gets a five or six or to a maximum of three throws, then his expected gain/loss (in rupees) is

(A) -10 (B) 10

(C) 0 (D) 1

114. The rate at which a substance cools in moving air, is proportional to the difference between the temperature of the substance and that of air. The temperature of air is 290 K and the substance cools from 370 K to 330 K in 10 minutes. Then the time to cool the substance upto 295 K is

(A) 40 min (B) 96 min
(C) 50 min (D) 60 min

115. If $x\frac{dy}{dx} = y(\log y - \log x + 1)$, then the solution of the equation is

(A) $\log\frac{x}{y} = cy$, where c is the constant of integration
(B) $\log\frac{y}{x} = cy$, where c is the constant of integration
(C) $\log\frac{x}{y} = cx$, where c is the constant of integration
(D) $\log\frac{y}{x} = cx$, where c is the constant of integration

116. The order and degree of the differential equation $\sqrt{\frac{dy}{dx}} - 4\frac{dy}{dx} - 7x = 0$ is respectively

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

117. The differential equation of all circles touching the Y -axis at the origin and centre on the X -axis is

(A) $x^2 + y^2 + 2xy\frac{dy}{dx} = 0$
(B) $x^2 - y^2 + 2xy\frac{dy}{dx} = 0$
(C) $2x^2 + y^2 + xy\frac{dy}{dx} = 0$
(D) $x^2 - 2y^2 + 2xy\frac{dy}{dx} = 0$

118. The area bounded by the curve $x^2 = 8y$ and the straight line $x - 8y + 2 = 0$ is

(A) $\frac{9}{8}$ sq. units (B) $\frac{15}{16}$ sq. units
(C) $\frac{9}{16}$ sq. units (D) $\frac{15}{8}$ sq. units

119. In a triangle ABC with usual notations, $\cot\frac{A}{2} + \cot\frac{B}{2} + \cot\frac{C}{2} =$

(A) $\frac{s^2}{\Delta}$, where Δ is the area of the triangle ABC .
(B) $\frac{s}{\Delta}$, where Δ is the area of the triangle ABC .
(C) $\frac{\Delta}{s}$, where Δ is the area of the triangle ABC .
(D) Δ, where Δ is the area of the triangle ABC .

120. The area of the rectangle having vertices P, Q, R, S with position vectors $-\hat{i}+\hat{j}+\hat{k}, \hat{i}+\hat{j}+\hat{k}, \hat{i}-\hat{j}+\hat{k}, -\hat{i}-\hat{j}+\hat{k}$ respectively is

(A) 1 square unit (B) 2 square units
(C) 3 square units (D) 4 square units

121. The value of $\int_0^1 \tan^{-1}\left(1 - x + x^2\right) dx$ is

(A) $\frac{\pi}{2} - \log 2$ (B) $\frac{\pi}{2} + \log 2$
(C) $\log 2$ (D) 0

122.

$$\int_3^5 \frac{\sqrt{x}\ dx}{\sqrt{8-x}\ +\sqrt{x}} =$$

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

123.

$$\int \frac{dx}{\sqrt{x}\ +x} =$$

(A) $\log\sqrt{x} + c$, where c is the constant of integration.
(B) $\log(\sqrt{x} + x) + c$, where c is the constant of integration.
(C) $\log(1 + \sqrt{x}) + c$, where c is the constant of integration.
(D) $2\log(1 + \sqrt{x}) + c$, where c is the constant of integration.

124. With usual notations, in $\triangle$ABC, the lengths of two sides are 10 cm and 9 cm respectively. If angles A, B, C are in A.P. then perimeter of $\triangle$ABC is

(A) $24 + 2\sqrt{6}$ cm (B) $24 + \sqrt{6}$ cm
(C) $24 - 2\sqrt{6}$ cm (D) $24 - \sqrt{6}$ cm

125.

$$\int \frac{dx}{e^x - 1} =$$

(A) $\log(e^x - 1) + x + c$, where c is the constant of integration.
(B) $\log(e^x - 1) - x + c$, where c is the constant of integration.
(C) $x - \log(e^x - 1) + c$, where c is the constant of integration.
(D) $\log(e^x - 1) - xe^x + c$, where c is the constant of integration.

126. The maximum value of $x^{2/3} + (x-2)^{2/3}$ is

(A) 0 (B) 2

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

127.

$$\int \left(\frac{x-3}{x^2+9}\right)^2 dx =$$

(A) $\frac{1}{3}\tan^{-1}(\frac{x}{3}) - \frac{3}{x^2+9} + c$, where c is the constant of integration.

(B) $\frac{1}{3}\tan^{-1}(\frac{x}{3}) - \frac{1}{x^2+9} + c$, where c is the constant of integration.

(C) $\frac{1}{3}\tan^{-1}(\frac{x}{3}) + \frac{3}{x^2+9} + c$, where c is the constant of integration.

(D) $\frac{1}{3}\tan^{-1}(\frac{x}{3}) + \frac{1}{x^2+9} + c$, where c is the constant of integration.

128. The point on the curve $4y^2 - 4y + 2x - 1 = 0$ at which the tangent becomes parallel to Y -axis is

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

(C) $(-1, -\frac{1}{2})$ (D) $(\frac{1}{2}, 0)$

129. The value of $\tan^2\left(\sec^{-1} 4\right) + \cot^2\left(\text{cosec}^{-1} 3\right)$ is

(A) 15 (B) 25

(C) 23 (D) 7

130. In a triangle ABC , with usual notations, if $a = 5,\ b = 4, \cos(A - B) = \frac{31}{32}$, then c =

(A) 6 (B) 7

(C) 5 (D) 2

131. Which of the following is the negation of the statement " For all M>0, there exist $x \in$ s such that $x \geqslant$ M"

(A) $\exists$M > 0 such that $x \geq$ M for all $x \in$ s

(B) $\exists$M > 0, $\exists x \in$ s such that $x \geq$ M

(C) $\exists$M > 0 such that $x <$ M for all $x \in$ s

(D) $\exists$M > 0, there exist $x \in$ s such that $x <$ M

132. The equation of the line passing through the point of intersection of $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-4}{5} = \frac{y-1}{2} = z$ and also through the point ($2, 1, -2$) is

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

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

(C) $\frac{x+1}{3} = \frac{y+1}{2} = \frac{z+1}{-1}$

(D) $\frac{x-1}{3} = \frac{y-1}{2} = \frac{z+1}{1}$

133. A particle moves along a curve $y = \frac{2x^3-1}{3}$. The points on the curve at which the y co-ordinate is changing 18 times the x co-ordinate are

(A) $(-3, -\frac{55}{3}), (3, -\frac{53}{3})$ (B) $(-3, \frac{53}{3}), (3, \frac{55}{3})$

(C) $(-3, -\frac{53}{3}), (3, \frac{55}{3})$ (D) $(-3, -\frac{55}{3}), (3, \frac{53}{3})$

134. The equation of motion of the particle is $s = at^2 + bt + c$. If the displacement after 1 second is 20 m , velocity after 2 seconds is 30 m/ seconds and the acceleration is 10 m/ seconds ^{2}, then

(A) $a + c = 2b$ (B) a + c = b

(C) a − c = b (D) $a + c = 3b$

135. If $y = \tan^{-1}\left[\frac{4\sin 2x}{\cos 2x - 6\sin^2 x}\right]$, then $\frac{dy}{dx}$ at $x = 0$ is

(A) $\frac{1}{8}$ (B) -8

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

136. If $x = a\sin 2t(1 + \cos 2t), y = b\cos 2t(1 - \cos 2t)$ then $\frac{dy}{dx}$ is equal to

(A) $\frac{b}{a}tant$ (B) $\frac{a}{b}tant$

(C) $\frac{b}{atant}$ (D) $\frac{a}{btant}$

137. The contrapositive of the statement $\sim p \vee (q \wedge \sim r)$ is

(A) $p \to q \wedge r$ (B) (q ∧ r) → p

(C) ∼ q∨ ∼ r → p (D) (r∨ ∼ q) →∼ p

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

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

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

139. If $y = \sqrt{x + \sqrt{y + \sqrt{x + \sqrt{y + \ldots\ldots\ldots\ldots\ldots\ldots\infty}}}}$, then $\frac{dy}{dx} =$

(A) $2y - 1$

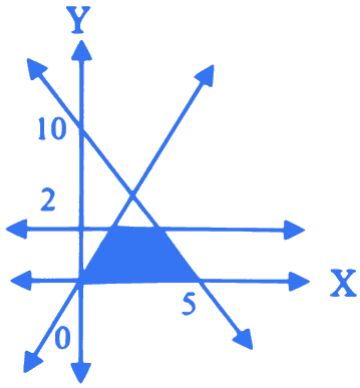
(B) $\frac{1}{2y-1}$

(C) $\frac{y^2-x}{2y^3-2xy-1}$

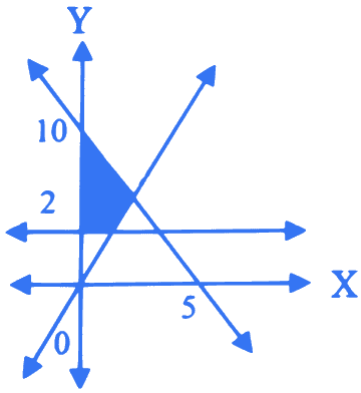
(D) ${}^{14}C_6$

140. The graph with correct feasible region of L.P.P. for the constraints $2x + y \leqslant 10, y \leqslant x, y \leqslant 2, x, y \geqslant 0$ is ...

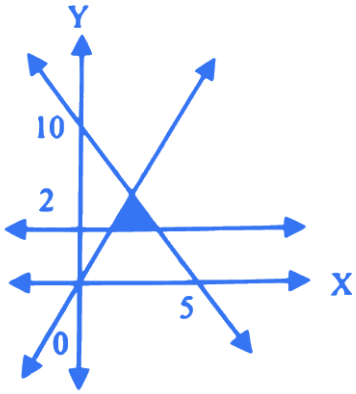
(A)



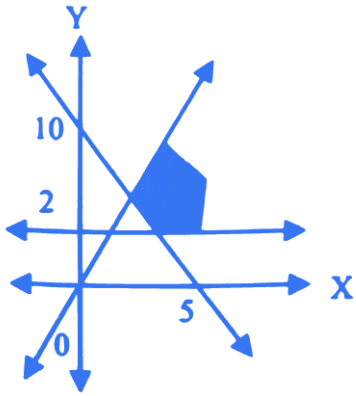
(B)



(C)



(D)



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141. The distance of the point $P(3,4,4)$ from the point of intersection of the line joining the points $Q(3,-4,-5), R(2,-3,1)$ and the plane $2x+y+z=7$ is

(A) 7 units (B) 9 units

(C) 11 units (D) 6 units

142. If $f(x)=3x+10$, $g(x)=x^2-1$, then $(fog)^{-1}(x)=$

(A) $(\frac{x-7}{3})$ (B) $(\frac{x-7}{3})^{\frac{1}{2}}$

(C) $(\frac{x-7}{3})^{\frac{1}{3}}$ (D) $(\frac{3}{x-7})^{\frac{3}{2}}$

143. A family consisting of a mother, father and their 8 children (4 boys and 4 girls) are to be seated at a round table in a party. How many ways can this be done if the mother and father sit together and the males and females alternate?

(A) 567 (B) 765

(C) 657 (D) 576

144. If $\bar{a},\bar{b},\bar{c}$ are three vectors such that $|\overrightarrow{a}|=\sqrt{31}, 4|\overrightarrow{b}|=|\overrightarrow{c}|=2$ and $2(\bar{a}\times\bar{b})=3(\bar{c}\times\bar{a})$ and if the angle between $\bar{b}$ and $\bar{c}$ is $\frac{2\pi}{3}$ then $\left|\frac{\bar{a}\times\bar{c}}{\bar{a}\cdot\bar{b}}\right|^2=$

(A) 1 (B) 2

(C) 3 (D) 11

145. Let $\bar{a}=2\hat{i}+\hat{j}+\hat{k}, \bar{b}=\hat{i}+2\hat{j}-\hat{k}$ and vector $\bar{c}$ be coplanar. If $\bar{c}$ is perpendicular to $\bar{a}$, then $\bar{c}$ is

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

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

146. If $x=-2+\sqrt{-3}$, then the value of $2x^4+5x^3+7x^2-x+38$ is equal to

(A) 1 (B) -2

(C) 3 (D) 5

147. Bag I contains 3 red and 2 green balls and Bag II contains 5 red and 3 green balls. A ball is drawn from one of the bag at random and it is found to be green. Then the probability that it is drawn from Bag I is

(A) $\frac{8}{31}$ (B) $\frac{12}{31}$

(C) $\frac{14}{31}$ (D) $\frac{16}{31}$

148. If the tangent at the point $(2\sec\theta, 3\tan\theta)$ to the hyperbola $\frac{x^2}{4}-\frac{y^2}{9}=1$ is parallel to $3x-y+4=0$, then the value of θ is

(A) 45° (B) 60°

(C) 30° (D) 90°

149. The equation of the plane containing the line $\frac{x}{1}=\frac{y}{2}=\frac{z}{3}$ and perpendicular to the plane containing the lines $\frac{x}{2}=\frac{y}{3}=\frac{z}{1}$ and $\frac{x}{3}=\frac{y}{2}=\frac{z}{1}$ is

(A) $x-13y+z=0$ (B) $13x-8y+5z=0$

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

150. The equation of the plane containing the line $\frac{x+1}{2}=\frac{y+2}{1}=\frac{z-2}{3}$ and the point $(1,-1,3)$ is

(A) $x-2y-3=0$ (B) $2x+y-1=0$

(C) $3x-2z+3=0$ (D) $2x-y-\mathrm{z}=0$

- End of Question Paper -