



SECTION NAME

Date : 06/03/2024
Time : 3 Hours 0 Minutes

MOCK TEST - 2
Marks : 300

Mathematics

- $(1 + \cos \frac{\pi}{8}) (1 + \cos \frac{3\pi}{8}) (1 + \cos \frac{5\pi}{8}) (1 + \cos \frac{7\pi}{8}) =$
 A) 1/2 B) 1/4 C) 1/8 D) 1/16
- If $1 + \sin x + \sin^2 x + \dots \infty = 4 + 2\sqrt{3}$, $0 < x < \pi$ and $x \neq \frac{\pi}{2}$, then $x =$
 A) $\frac{\pi}{3}, \frac{2\pi}{3}$ B) $\frac{\pi}{6}, \frac{\pi}{3}$ C) $\frac{\pi}{3}, \frac{5\pi}{6}$ D) $\frac{2\pi}{3}, \frac{\pi}{6}$
- If $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ be the A.M. of a and b , then $n =$
 A) 1 B) -1 C) 0 D) None of these
- A ray of light is sent along the line which passes through the point $(2, 3)$. The ray is reflected from the point P on x -axis. If the reflected ray passes through the point $(6, 4)$, then the coordinates of P are
 A) $(\frac{26}{7}, 0)$ B) $(0, \frac{26}{7})$ C) $(-\frac{26}{7}, 0)$ D) none of these
- Consider a curve $ax^2 + 2hxy + by^2 = 1$ and a point P not on the curve. A line drawn from the point P intersects the curve at points Q and R . If the product $PQ \cdot PR$ is independent of the slope of the line, then the curve is a
 A) parabola B) circle C) ellipse D) none of these
- Consider a branch of the hyperbola $x^2 - 2y^2 - 2\sqrt{2}x - 4\sqrt{2}y - 6 = 0$ with vertex at the point A . Let B be one of the end points of its latus rectum. If C is the focus of the hyperbola nearest to the point A , then the area of triangle ABC is
 A) $1 - \sqrt{2/3}$ B) $\sqrt{3/2} - 1$ C) $1 + \sqrt{2/3}$ D) $\sqrt{3/2} + 1$
- Let $R = \{(1, 3), (4, 2), (2, 4), (2, 3), (3, 1)\}$ be a relation on the set $A = \{1, 2, 3, 4\}$. The relation R is
 A) a function B) transitive C) not symmetric D) reflexive

8. The product of matrices $A = \begin{bmatrix} \cos^2 \theta & \cos \theta \sin \theta \\ \cos \theta \sin \theta & \sin^2 \theta \end{bmatrix}$ and $\sin B = \begin{bmatrix} \cos^2 \phi & \cos \phi \sin \phi \\ \cos \phi \sin \phi & \sin^2 \phi \end{bmatrix}$ is a null matrix if $\theta - \phi =$
- A) $2n\pi, n \in Z$ B) $n\frac{\pi}{2}, n \in Z$ C) $(2n + 1)\frac{\pi}{2}, n \in Z$ D) $n\pi, n \in Z$
9. If $y^3 - y = 2x$, then $\left(x^2 - \frac{1}{27}\right) \frac{d^2y}{dx^2} + x \frac{dy}{dx} =$
- A) y B) $\frac{y}{3}$ C) $\frac{y}{9}$ D) $\frac{y}{27}$
10. An artillery target may be either at point I with the probability $\frac{8}{9}$ or at the point II with probability $\frac{1}{9}$. We have 21 shells each of which can be fired either at point I or II. Each shell may hit the target independently of the other shell with probability $\frac{1}{2}$. The numbers of shells which must be fired at point I to hit the target with maximum probability is
- A) 9 B) 10 C) 11 D) 12
11. If the integral $\int \frac{5 \tan x}{\tan x - 2} dx = x + a \ln |\sin x - 2 \cos x| + k$, then a is equal to:
- A) -1 B) -2 C) 1 D) 2
12. The area of the portion of the circle $x^2 + y^2 = 1$, which lies inside the parabola $y^2 = 1 - x$, is
- A) $\frac{\pi}{2} - \frac{2}{3}$ B) $\frac{\pi}{2} + \frac{2}{3}$ C) $\frac{\pi}{2} + \frac{4}{3}$ D) $\frac{\pi}{2} - \frac{4}{3}$
13. If the p th, q th and r th terms of a G.P. are positive numbers a, b and c , respectively, then the angle between the vectors $i_l n a + j_l n b + k_l n c$ and $i(q - r) + j(r - p) + k(p - q)$ is
- A) $\frac{\pi}{3}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{2}$ D) none of these
14. The shortest distance between the lines given by $r = (8 + 3\lambda)\hat{i} - (9 + 16\lambda)\hat{j} + (10 + 7\lambda)\hat{k}$ and $r = 15\hat{i} + 29\hat{j} + 5\hat{k} + \mu(3\hat{i} + 8\hat{j} - 5\hat{k})$ is
- A) 84 B) 14 C) 21 D) 16
15. A letter is known to have come either from LONDON or CLIFTON; on the postmark only the two consecutive letters ON are legible. The probability that it came from LONDON is
- A) $\frac{5}{17}$ B) $\frac{12}{17}$ C) $\frac{17}{30}$ D) $\frac{3}{5}$
16. Let Z denote the set of all integers where $A = \{(a, b) : a^2 + 3b^2 = 28, a, b \in Z\}$ and $B = \{(a, b) : a > b, a, b \in Z\}$, then the number of elements in $A \cap B$ is
- A) 2 B) 6 C) 4 D) 5

17. If the mean deviation of the numbers $1, 1 + d, \dots, 1 + 100d$ from their mean is **255**, then d is equal to
- A) 10.1 B) 20.2 C) 10.0 D) 20.0
18. Statement I Polar form of $\frac{1+7i}{(2-i)^2}$ is $\sqrt{2} [\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4}]$ Statement II Polar form of $\frac{1+3i}{1-2i}$ is $\sqrt{2} [\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4}]$
- A) Statement I is correct B) Statement II is correct C) Both are correct
- D) Neither I nor II is correct
19. A unit vector a makes an angle $\frac{\pi}{4}$ with Z -axis, if $\hat{a} + \hat{i} + \hat{j}$ is a unit vector, then a is equal to
- A) $\frac{\hat{i}}{2} + \frac{\hat{j}}{2} + \frac{\hat{k}}{2}$ B) $\frac{\hat{i}}{2} + \frac{\hat{j}}{2} - \frac{\hat{k}}{\sqrt{2}}$ C) $-\frac{\hat{i}}{2} - \frac{\hat{j}}{2} + \frac{\hat{k}}{\sqrt{2}}$ D) $\frac{\hat{i}}{2} - \frac{\hat{j}}{2} - \frac{\hat{k}}{\sqrt{2}}$
20. Let $f : R \rightarrow R$ be a continuous function. Then, $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\frac{\pi}{4} \int_2^{\sec^2 x} f(x) dx}{x^2 - \frac{\pi^2}{16}}$ is equal to
- A) $f(2)$ B) $2f(2)$ C) $2f(\sqrt{2})$ D) $4f(2)$
21. The value of $\tan 9^\circ - \tan 27^\circ - \tan 63^\circ + \tan 81^\circ$ is
22. If $x^2 - x + 1 = 0$, then find value of $\sum_{n=1}^5 (x^n + \frac{1}{x^n})^2$.
23. The number of 3 digit numbers having atleast one of their digit as 5 are
24. If the number of terms in $(x + 1 + \frac{1}{x})^n$ ($n \in I^+$) is 401 then value of n is
25. If PSQ is the focal chord of the parabola $y^2 = 8x$ such that $SP = 6$. Then the length of SQ is
26. The real value of m for which the substitution $y = u^m$ will transform the differential equation $2x^4 y \frac{dy}{dx} + y^4 = 4x^6$ into a homogeneous equation is
27. The probability that in a year of the 22nd century chosen at random there will be 53 Sundays is
28. If $\lim_{x \rightarrow 0} \frac{(1+x)^{1/x} - e + \frac{1}{2}ex}{x^2} = \frac{11e}{k}$ then find k
29. If $0 \leq [x] < 2$, $-1 \leq [y] < 1$ and $1 \leq [z] < 3$ where $[.]$ denotes greatest integral function then the maximum value of the determinant. $D = \begin{vmatrix} [x] + 1 & [y] & [z] \\ [x] & [y] + 1 & [z] \\ [x] & [y] & [z] + 1 \end{vmatrix}$ is
30. If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = -\frac{1}{\lambda} \cos 4x + B$, then find value of λ .

Physics

31. The mass of a box measured by a grocer's balance is 2.3 kg. Two gold pieces of masses 20.15 g and 20.17 g are added to the box. What is (i) the total mass of the box (ii) the difference in the mass of the

- pieces to correct significant figures?
- A) 2.8 kg, 0.08 g B) 2.9 kg, 0.02 g C) 2.3 kg, 0.02 g D) 3.0 kg, 0.02 g
32. A Carnot's reversible engine converts $1/6$ heat input into work. When the temperature of sink is reduced by 62 K, the efficiency of Carnot's cycle becomes $1/3$. The temperatures of the source and the sink will respectively be
- A) 350 K, 300 K B) 390 K, 330 K C) 372 K, 310 K D) None of these
33. An insulated container of gas has two chambers separated by an insulating partition. one of the chambers has volume V_1 and contains ideal gas at pressure p_1 and temperature T_1 . The other chamber has volume V_2 and contains ideal gas at pressure p_2 and temperature T_2 . if the partition is removed without doing any work on the gas, the final equilibrium temperature of the gas in the container will be
- A) $\frac{T_1 T_2 (p_1 V_1 + p_2 V_2)}{p_1 V_1 T_2 + p_2 V_2 T_1}$ B) $\frac{p_1 V_1 T_1 + p_2 V_2 T_2}{p_1 V_1 + p_2 V_2}$ C) $\frac{p_1 V_1 T_2 + p_2 V_2 T_1}{p_1 V_1 + p_2 V_2}$ D) $\frac{T_1 T_2 (p_1 V_1 + p_2 V_2)}{p_1 V_1 T_1 + p_2 V_2 T_2}$
34. A simple pendulum has a time period of 3.0 s. If the point of suspension of the pendulum starts moving vertically upward with a velocity $v = kt$ where $k = 4.4 \text{ ms}^{-2}$. The new time period will be (Take $g = 10 \text{ ms}^{-1}$)
- A) $\frac{9}{4} \text{ S}$ B) $\frac{5}{3} \text{ S}$ C) 2.5 S D) 4.4 S
35. The torque acting on a dipole of moment \vec{P} in an electric field \vec{E} is
- A) $\vec{P} \cdot \vec{E}$ B) $\vec{P} \times \vec{E}$ C) Zero D) $\vec{E} \times \vec{P}$
36. Let C be the capacitance of a capacitor discharging through a resistor R. suppose t_1 is the time taken for the energy stored in the capacitor to reduced to half its initial value and t_2 is the time taken for the charge to reduce to one-fourth its initial value. Then, the ratio t_1 / t_2 will be
- A) 1 B) 1/2 C) 1/4 D) 2
37. A thermally insulated rigid container contains an ideal gas. It is heated through a resistance of 100Ω by passing a current of 1 A for 5 min, then change in internal energy of the gas is
- A) zero B) 30 kJ C) 10 kJ D) 20 kJ
38. A long wire carries a steady current. It is bent into a circle of one turn and the magnetic field at the centre of the coil is B. It is then bent into a circular loop of n turns. Then magnetic field at the centre of the coil will be
- A) nB B) $n^2 B$ C) $2 nB$ D) $2 n^2 B$
39. A circuit contains a resistance of 4Ω and an inductance of 0.68 H and an alternating effective emf of 500 V of frequency 120 cycles/s. The current is

A) 0.25 A B) 0.976 A C) 1.5 A D) 0.025 A

40. The electron of a hydrogen atom revolves round the proton in a circular n^{th} orbit of radius $r_n = \frac{\epsilon_0 n^2 \hbar^2}{\pi m e^2}$ with a speed $v_n = \frac{e^2}{2\epsilon_0 n \hbar}$. The current due to the circulating charge is proportional to

A) e^2 B) e^3 C) e^5 D) e^6

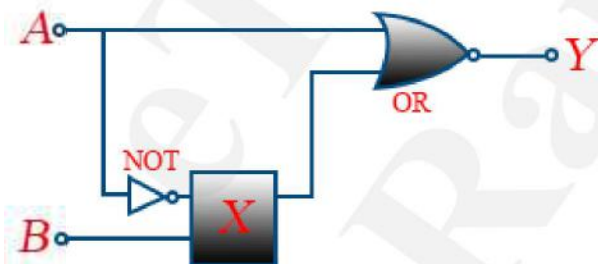
41. The manifestation of band structure in solids is due to

A) Heisenberg's uncertainty principle B) Pauli's exclusion principle

C) Bohr's correspondence principle D) Boltzmann's law

42. The logic circuit shown in figure yield the following truth table

| A | B | Y |
|---|---|---|
| 1 | 1 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 0 | 0 | 0 |



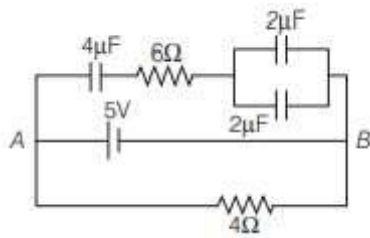
The gate X in the diagram is

A) NAND B) XOR C) AND D) NOR

43. A spring of spring constant $5 \times 10^3 \text{ Nm}^{-1}$ is stretched initially by 5 cm from the unstretched position. Then the work required to stretch it further by another 5 cm is

A) 12.50 Nm B) 18.75 Nm C) 25.00 Nm D) 6.25 Nm

44. Calculate the amount of charge on capacitor of $4\mu\text{F}$. The internal resistance of battery is 1Ω .



- A) $8\mu\text{C}$ B) zero C) $16\mu\text{C}$ D) $4\mu\text{C}$

45. A stone is projected up from the top of a tower 58.8 m high with a velocity of 19.6 m/s. It reaches the foot of the tower in:

- A) $\sqrt{12}\text{s}$ B) $\sqrt{6}\text{s}$ C) 2s D) 6s

46. One steel pipe of length 660 m is struck a blow which produces loud sound. A listener at the other end hears two sounds at an interval of 1.89 sec; one from the wave that has travelled along the metal portion of the pipe and the other from the wave that has travelled through air. If the density of steel is $8 \times 10^3 \text{ kg/m}^3$, what is the bulk modulus of elasticity of steel?

- A) $2.88 \times 10^{11} \text{ N/m}^2$ B) $5.76 \times 10^{11} \text{ N/m}^2$ C) $8.64 \times 10^{11} \text{ N/m}^2$ D) $11.52 \times 10^{11} \text{ N/m}^2$

47. If there is a positive error of 50% in the measurement of velocity of a body, then the error in the measurement of kinetic energy is

- A) 25% B) 50% C) 100% D) 125%

48. The mass of an α -particle is

- A) Less than the sum of masses of two protons and two neutrons B) Equal to mass of four protons
C) Equal to mass of four neutrons D) Equal to sum of masses of two protons and two neutrons

49. The value of $\frac{\sin\left(\frac{-11\pi}{3}\right) \cdot \tan\left(\frac{35\pi}{6}\right) \cdot \sec\left(\frac{-7\pi}{3}\right)}{\cos\left(\frac{5\pi}{4}\right) \cdot \text{cosec}\left(\frac{7\pi}{4}\right) \cdot \cos\left(\frac{17\pi}{6}\right)}$ is

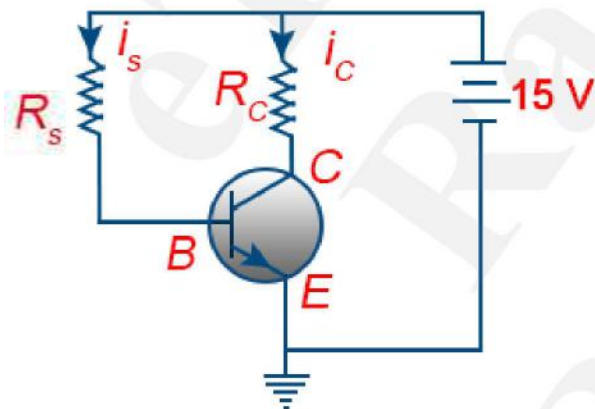
- A) $\frac{15}{\sqrt{3}}$ B) $\frac{2}{\sqrt{3}}$ C) $\frac{8}{\sqrt{3}}$ D) $\frac{1}{\sqrt{3}}$

50. Which of the following lenses is used to correct the defect of hypermetropia?

- A) Bifocal lens B) Convex lens C) Concave lens D) Cylindrical lens

51. The diameter of a cylinder is measured using a vernier callipers with no zero error. It is found that the zero of the vernier scale lies between 5.10 cm and 5.15 cm of the main scale. The vernier scale has 50 division equivalent to 2.45 cm. The 24th division of the vernier scale exactly coincides with one of the main scale divisions. The diameter (in cm) of the cylinder is _____.

52. A quarter horse power motor runs at a speed of 600 r.p.m. Assuming 40% efficiency the work done(in J) by the motor in one rotation will be _____.
53. A rubber tube of length 8 m is hung from the ceiling of a room.then the increase in length of the rope due to its own weight is (in mm)_____. (Given Young's modulus of elasticity of rubber = $5 \times 10^6 \text{ Nm}^{-2}$ and density of rubber = $1.5 \times 10^6 \text{ kg m}^{-3}$. Take $g = 10 \text{ ms}^{-2}$)
54. The fundamental frequency of a sonometer wire increases by 5 Hz if its tension is increased by 21%. The fundamental frequency of the sonometer wire in a Hz is _____.
55. A circuit has a resistance of 12Ω and an impedance of 15Ω . The power factor of the circuit will be _____.
56. Sea water at frequency $\nu = 4 \times 10^8 \text{ Hz}$ has permittivity $\epsilon = 80 \epsilon_0$, permeability $\mu \approx \mu_0$ and resistivity $\rho = 0.25 \Omega\text{-m}$. Imagine a parallel plate capacitor immersed in sea water and driven by an alternating voltage source $V(t) = V_0 \sin(2\pi\nu t)$. The ratio of amplitude of the conduction current density to the displacement current density is _____.
57. Two thin symmetrical lenses of different nature and of different material have equal radii of curvature $R = 60 \text{ cm}$. The lenses are put close together and immersed in water ($\mu_w = \frac{4}{3}$). The focal length of the system in water is 30 cm. then the difference between refractive indices of the two lenses is _____.
58. An interference pattern is produced using Young's double slit experiment with sunlight as source. Assume the wavelength of blue light and red light roughly a 400 nm and 600 nm, respectively. As we move away from the centre, at which minimum order of blue will we observe a blue fringe superposing on a red fringe is _____.
59. In the following common emitter circuit if $\beta = 100$, $V_{CE} = 7V$, $V_{BE} = \text{negligible}$, $R_C = 2 \text{ k}\Omega$ then I_B is _____ mA.



60. There is a crater of depth $\frac{R}{100}$ on the surface of the moon (radius R). A projectile is fired vertically upward from the crater with velocity, which is equal to the escape velocity ' v ' from the surface of moon. Find the maximum height attained by the projectile (in terms of R).

Chemistry

61. The oxide of an element contains 67.67 % of oxygen and the vapour density of its volatile chloride is 79. Equivalent weight of the element is
- A) 2.46 B) 3.82 C) 4.36 D) 4.96
62. $l = 3$, then the values of magnetic quantum numbers are

A) $\pm 1, \pm 2, \pm 3$ B) $0, \pm 1, \pm 2, \pm 3$ C) $-1, -2, -3$ D) $0, +1, +2, +3$

63. In PO_4^{3-} ion the formal charge on the oxygen atom of P—O bond is

A) +1 B) -1 C) -0.75 D) +0.75

64. 0.16 g of methane is subjected to combustion at 27°C in a bomb calorimeter system. The temperature of the calorimeter system (including water) was found to rise by 0.5°C . Calculate the heat of combustion of methane at constant volume. The thermal capacity of the calorimeter system is 17.7 kJ K^{-1} ($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$)

A) -695 kJ mol^{-1} B) $-1703 \text{ kJ mol}^{-1}$ C) -890 kJ mol^{-1} D) -885 kJ mol^{-1}

65. 18 ml of mixture of acetic acid and sodium acetate required 6 ml of 0.1 M NaOH for neutralization of the acid and 12 ml of 0.1 M HCl for reaction with salt separately. If pK_a of the acid is 4.75, what is the pH of the mixture?

A) 5.05 B) 4.75 C) 4.5 D) 4.6

66. The oxidation state of oxygen in $\text{O}_2 \text{PtF}_6$ is

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

67. The oxidation state of boron family shows which of the following trend for stable +1 oxidation state?

A) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$ (+1 O.S. stability increases)

B) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$ (stability of +3 oxidation states)

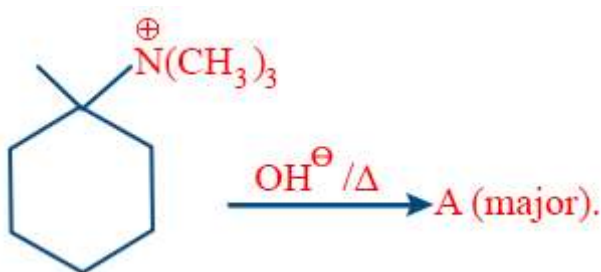
C) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$ (stability of +1 oxidation states)

D) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$ (+3 O.S. stability increases)

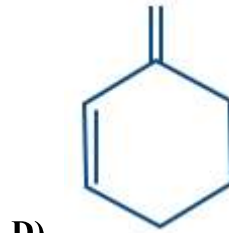
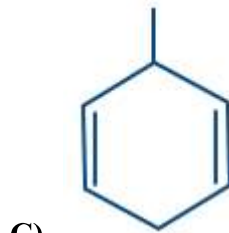
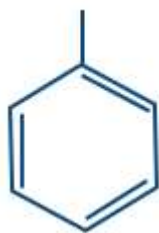
68. The percentage of sulphur in an organic compound whose amount of 0.32 g produces 0.233 g of BaSO_4 (Atomic weight of Ba = 137, S = 32) is

A) 1.0 B) 10.0 C) 25.3 D) 32.1

69.



The major organic product 'A' is

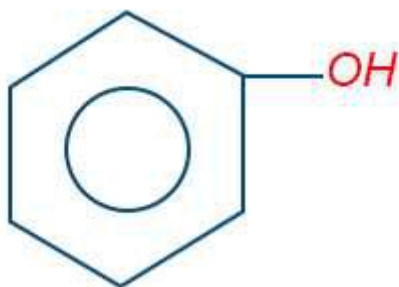


70. An ideal solution contains two volatile liquids A ($P^0 = 100$ torr) and B ($P^0 = 200$ torr). If mixture contains 1 mole of 'A' and 3 moles of 'B'. Then, total vapour pressures of distillate is
- A) 150 torr B) 188.8 torr C) 185.72 torr D) 198.88 torr
71. Resistance of a conductivity cell filled with a solution of an electrolyte of concentration 0.1 M is 100Ω . The conductivity of this solution is 1.29 S m^{-1} . Resistance of the same cell when filled with 0.2 M of the same solution is 520Ω . The molar conductivity of 0.2 M solution of the electrolyte will be
- A) $124 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$ B) $1240 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$ C) $1.24 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$
- D) $12.4 \times 10^2 \text{ S m}^2 \text{ mol}^{-1}$
72. The reaction $A \rightarrow B$ follows first order kinetics. The time taken for 0.8 mole of A to produce 0.6 mole of B is 1 hour. What is the time taken for conversion of 0.9 mole of A to produce 0.675 mole of B?
- A) 2 hour B) 1 hour C) 0.5 hour D) 0.25 hour
73. The chief source of iodine in which it is present as sodium iodate is
- A) Sea weeds B) Caliche C) Carnallite D) Iodine never exists as sodium iodate
74. What is the correct order of spin only magnetic moment (in B.M.) of Mn^{2+} , Cr^{2+} and V^{2+} ?
- A) $\text{Mn}^{2+} > \text{V}^{2+} > \text{Cr}^{2+}$ B) $\text{V}^{2+} > \text{Cr}^{2+} > \text{Mn}^{2+}$ C) $\text{Mn}^{2+} > \text{Cr}^{3+} > \text{V}^{2+}$ D) $\text{Cr}^{2+} > \text{V}^{2+} > \text{Mn}^{2+}$
75. $[\text{CO}(\text{NH}_3)_4(\text{NO}_2)_2]\text{Cl}$ exhibits
- A) linkage isomerism, ionisation isomerism and optical isomerism
- B) linkage isomerism, geometrical isomerism and optical isomerism
- C) linkage isomerism, ionisation isomerism and geometrical isomerism

D) ionisation isomerism, geometrical isomerism and optical isomerism

76. Which of the following compounds is most acidic

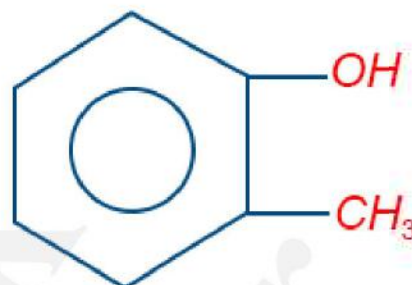
A) $Cl - CH_2 - CH_2 - OH$



B)

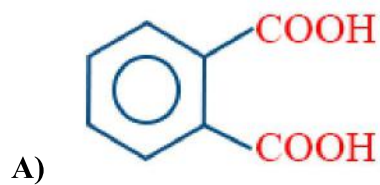


C)



D)

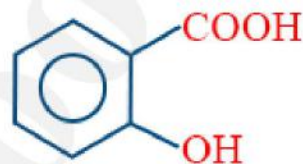
77. Identify the product in the following reaction :



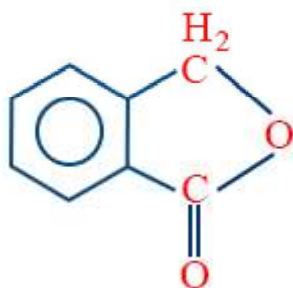
B)



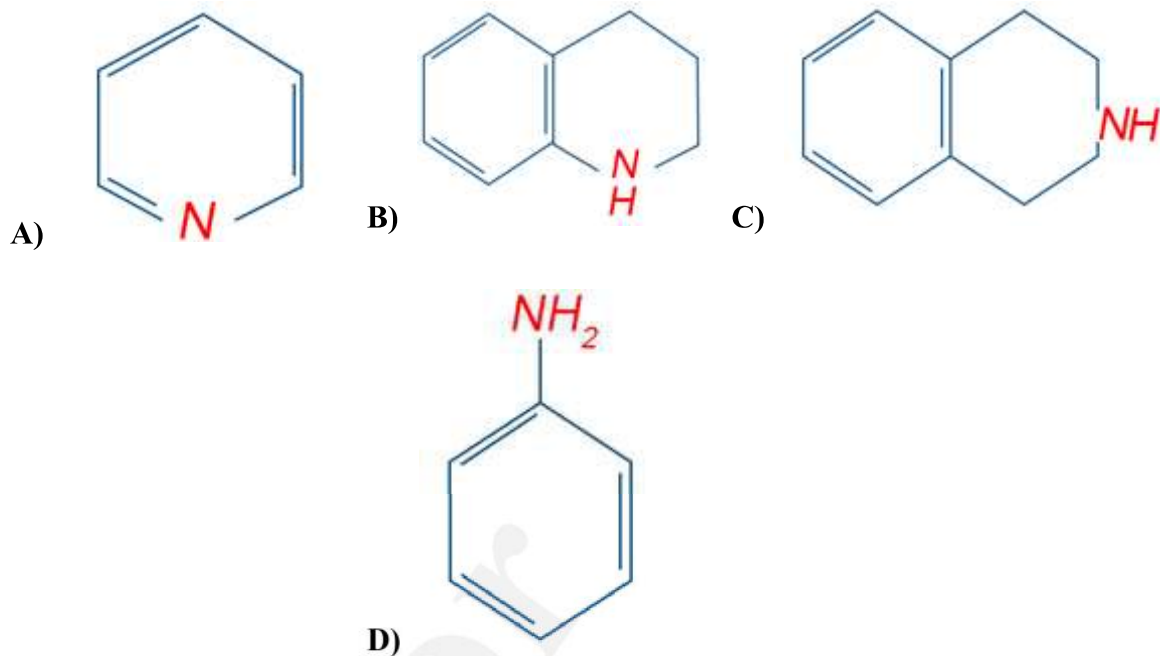
C)



D)



78. Which of the following is most basic?



79. Which of the following is true?

- (i) sucrose is a non reducing agent
- (ii) glucose is oxidized by bromine water
- (iii) glucose rotates plane polarized light in clockwise direction
- (iv) fructose is oxidized by bromine water

Select the correct answer during the coded given below

- A) (i), (ii), (iii) B) (i), (ii) only C) (ii), (iii) only D) (i) (iv) only

80. The first ionisation potential of Na, Mg, Al and Si are in order

- A) $\text{Na} > \text{Mg} > \text{Al} > \text{Si}$ B) $\text{Na} < \text{Mg} < \text{Al} < \text{Si}$ C) $\text{Na} < \text{Si} < \text{Al} < \text{Mg}$ D) $\text{Na} < \text{Al} < \text{Mg} < \text{Si}$

81. If equal moles of water and urea are taken in a vessel. _____ will be the mass percentage of urea in the solution.

82. Let IP stand for ionization potential. The IP, and IP_2 of Mg are 178 and 348 kcal mol⁻¹. The energy required for the following reaction is _____ kcal.



83. O_2^{2+} has a bond order is _____.

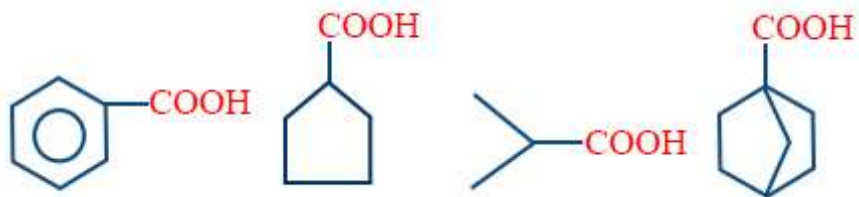
84. The number of isomers possible for $\text{C}_7\text{H}_8\text{O}$ are _____

85. The charge required to deposit 40.5 g of Al (atomic mass = 27.0 g) from the fused $\text{Al}_2(\text{SO}_4)_3$ is _____ $\times 10^5$ C.

86. A reaction takes place in three steps the rate constant are K_1 , K_2 and K_3 the overall rate constant

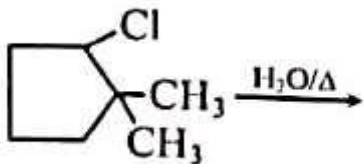
$K = \frac{K_1 K_3}{K_2}$. If the energies of activation are 40, 30 and 20 kJ/mol, the overall energy of activation is (assuming A to be constant for all)

87. How many the following compounds will give HVZ reaction



88. Find the oxidation no of Mn in the product of alkaline oxidative fusion of MnO_2 ?

89.



How many 3° alcohol are obtain as product (including stereoisomer)?

90. How many among the following are oligosaccharides?

- i. Cellulose
- ii. Lactose
- iii. Sucrose
- iv. Raffinose
- v. Ribose
- vi. Galactose
- vii. Glycogen
- viii. Starch

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