SECTION NAME

Date : 06/03/2024   MOCK TEST - 1
Time : 3 Hours 0 Minutes   Marks : 300

Mathematics

1. The sum of the radii of inscribed and circumscribed circles for an n sided regular polygon of side a, is

   A) $a\cot\left(\frac{\pi}{n}\right)$ **B)** $\frac{a}{2}\cot\left(\frac{\pi}{2n}\right)$ **C)** $a\cot\left(\frac{\pi}{2n}\right)$ **D)** $\frac{a}{4}\cot\left(\frac{\pi}{2n}\right)$

2. If α, β be the roots of $x^2 + px - q = 0$ and γ, δ be the roots of $x^2 + px + r = 0$, $q + r \neq 0$, then $\frac{(\alpha-\gamma)(\alpha-\delta)}{(\beta-\gamma)(\beta-\delta)} =$

   A) 1 **B)** q **C)** r **D)** $q+r$

3. In the expansion of $\left(2x^2 - \frac{1}{x}\right)^{12}$, the term independent of x is

   A) 10th **B)** 9th **C)** 8th **D)** 7th

4. Suppose a, b, c are distinct real numbers. If a, b, c are in A.P and a^2, b^2, c^2 are in H.P., then

   A) $-\frac{a}{2}$, b, c are in G.P. **B)** $a+b=c$ **C)** $a=b+c$ **D)** a, b, c are in G.P.

5. If points $(5, 5)$, $(10, k)$ and $(-5, 1)$ are collinear, then $k =$

   A) 3 **B)** 5 **C)** 7 **D)** 9

6. The eccentricity of an ellipse whose pair of a conjugate diameter are $y = x$ and $3y = -2x$ is

   A) $\frac{2}{3}$ **B)** $\frac{1}{3}$ **C)** $\frac{1}{\sqrt{3}}$ **D)** None of these

7. The value of $\lim_{x\to 1} \frac{x^n + x^{n-1} + x^{n-2} + \dots + x^2 + x - n}{x-1}$ is

   A) $\frac{n(n+1)}{2}$ **B)** 0 **C)** 1 **D)** n

8. A sample of 35 observations has the mean 80 and standard deviation as 4. A second sample of 65 observation from the same population has mean 70 and standard deviation 3, then the standard deviation of the combined sample is

   A) 5.85 **B)** 5.58 **C)** 34.2 **D)** None of these

9. Let R be the real line. Consider the following subjects of the plane $R \times R$.

$S = [(x, y) : y = x + 1$ and $0 < x < 2]$, $T = [(x, y) : x - y$ is an integer]. Which one of the following is true?

A) Neither S nor T is an equivalence relation on R **B)** Both S and T are equivalence relations on R

C) S is an equivalence relation on R but T is not   **D)** T is an equivalence relation on R but S is not

10. The number of solutions to the equation $\tan^{-1}\left(\frac{x}{3}\right) + \tan^{-1}\left(\frac{x}{2}\right) = \tan^{-1} x$ is

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

11. The value of θ in $[0, 2\pi]$ such that the matrix

$[2sin\theta - 1 sin\theta cos\theta sin(\theta + \pi) 2cos\theta - \sqrt{3}tan\theta cos(\theta - \pi)tan(\pi \boxtimes \theta)0]$
$$\begin{bmatrix} 2\sin\theta - 1 & \sin\theta & \cos\theta \\ \sin(\theta + \pi) & 2\cos\theta - \sqrt{3} & \tan\theta \\ \cos(\theta - \pi) & \tan(\pi \boxtimes \theta) & 0 \end{bmatrix}$$

is skew-symmetric, is

   A) $\pi/2$ **B)** $\pi/3$ **C)** $\pi/4$ **D)** $\pi/6$

12.

$A = [1000110 - 24]\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & -2 & 4 \end{bmatrix}$, $I = [100010001]\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ $A^{-1}\frac{1}{6} = \left(A^2 + CA + DI\right)$ then C and D are

equal to

   A) $-11, 6$ **B)** $-6, 31/6$ **C)** $6, 11$ **D)** $-6, -11$

13. If $\cos\left(\frac{x}{2}\right)\cos\left(\frac{x}{2^2}\right)\cos\left(\frac{x}{2^3}\right)\ldots\ldots\ldots\infty = \frac{\sin x}{x}$ then $\frac{1}{2^2}\sec^2\left(\frac{x}{2}\right) + \frac{1}{2^4}\sec^2\left(\frac{x}{2^2}\right) + \ldots\ldots\infty = \underline{\hspace{2cm}}$

   A) $\mathrm{cosec}^2 x - \frac{1}{x}$ **B)** $\mathrm{cosec}^2 x - \frac{1}{x^2}$ **C)** $\mathrm{cosec}^2 x + \frac{1}{x}$ **D)** $\mathrm{cosec}^2 x + \frac{1}{x^2}$

14. Two cyclists start from the junction of two perpendicular roads, their velocities being $3\,v$ m/minute and $4\,v$ m/minute. The rate at which the two cyclists are separating is

   A) $\frac{7}{2}\,v$ m/minute   **B)** $5\,v$ m/minute   **C)** v m/minute   **D)** None of these

15. The value of $\int e^x \cdot \frac{x^2+1}{(x+1)^2} dx$ is

   A) $e^x\left(\frac{x-1}{x+1}\right) + C$ **B)** $e^x\left(\frac{x+1}{x-1}\right) + C$ **C)** $e^x \cdot x + C$ **D)** None of these

16. The solution of the equation
$y - x\frac{dy}{dx} = a\left(y^2 + \frac{dy}{dx}\right)$ is

   A) $y = c(x + a)(1 - ay)$ **B)** $y = c(x + a)(1 + ay)$ **C)** $y = c(x - a)(1 + ay)$ **D)** None of these

17. The unit vector perpendicular to $3\mathbf{i} + \mathbf{j} - \mathbf{k}$ and $12\mathbf{i} + 5\mathbf{j} - 5\mathbf{k}$, is

   A) $\dfrac{3\mathbf{i}-3\mathbf{j}+9\mathbf{k}}{\sqrt{115}}$ B) $\dfrac{3\mathbf{i}+5\mathbf{j}-9\mathbf{k}}{\sqrt{115}}$ C) $\dfrac{-5\mathbf{i}+3\mathbf{j}-9\mathbf{k}}{\sqrt{115}}$ D) $\dfrac{5\mathbf{i}+3\mathbf{j}+9\mathbf{k}}{\sqrt{115}}$

18. The angle between the straight lines whose direction consines are given by $2l + 2m - n = 0, \ mn + nl + lm = 0$ is

   A) $\dfrac{\pi}{2}$ B) $\dfrac{\pi}{3}$ C) $\dfrac{\pi}{4}$ D) none of these

19. What is the shortest distance of the point $(1, 2, 3)$ from x- axis ?

   A) 1 B) $\sqrt{6}$ C) $\sqrt{13}$ D) $\sqrt{14}$

20. Two events A and B have probabilities 0.25 and 0.50 respectively. The probability that both A and B occur simultaneously is 0.14 . Then the probability that neither A nor B occurs is

   A) 0.39   B) 0.25   C) 0.11   D) None of these

21. 20 teachers of a school either teach mathematics or physics, 12 of them teach mathematics, while 4 teach both the subjects. Then the number of teachers teaching physics only is

22. Find the number of different signals that can be generated by arranging at least 2 flags in order (one below the other) on a vertical staff, if five different flags are available.

23. Two tangents PQ and PR drawn to the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ from point $P(16, 7)$. If the centre of the circle is C, then the area of quadrilateral $PQCR$ will be ____sq. units

24. If 'P' be a point on the parabola $y^2 = 3\,(2x - 3)$ and M is the foot perpendicular drawn from 'P' on the directrix of the parabola, then length of each side of an equilateral triangle SMP, where 'S' is focus of the parabola is

25. If $f(3) = 4$ and $f'(3) = 1$, then $\lim_{x \to 3} \dfrac{xf(3) - 3f(x)}{x-3}$

26. The value of $\int_0^{\pi/2} \log\left(\dfrac{4+3\sin x}{4+3\cos x}\right) dx$ is _____

27. The area of the region bounded by the curves $y = |\, x - 1|$ and $y = 3 - |\, x|$ is ____sq units

28. If $\vec{a} = \hat{i} + \hat{j} + \hat{k},\ \vec{b} = 4\hat{i} + 3\hat{j} + 4\hat{k}$ and $\vec{c} = \hat{i} + \alpha\hat{j} + \beta\hat{k}$ are linearly dependent vectors and $|\vec{c}\,| = \sqrt{3}$, then $\beta =$ ___

29. If the angle between the planes $2x - y + 2z = 3$ and $3x + 6y + cz = 4$ is $\cos^{-1}\left(\dfrac{4}{21}\right)$, then $c^2 =$

30. A problem in mathematics is given to three students A, B and C and their respective probability of solving the problem is $1/2, 1/3$ and $1/4$ then find the probability that the problem is solved.

Physics

31. A constant retarding force of 50 N is applied to a body of mass 20 kg moving initially with a speed of 15 ms^{-1} . How long does the body take to stop?

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

32. The graph shows the variation of temperature (T) of one kilogram of a material with the heat (H) supplied to it. At O, the substance is in the solid state. From the graph, we can conclude that
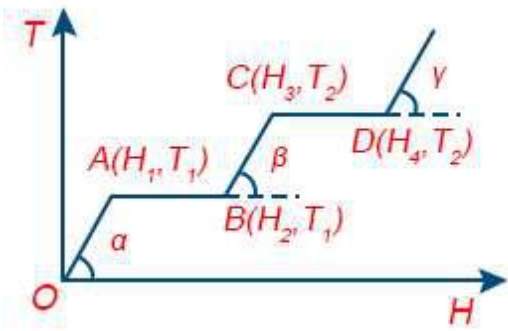
A) T_2 is the melting point of the solid **B)** BC represents the change of state from solid to liquid

C) $(H_2 - H_1)$ represents the latent heat of vaporization of the liquid

D) $(H_3 - H_1)$ represents the latent heat of vaporization of the liquid

33. If C_p and C_v denote the specific heats of nitrogen per unit mass at constant pressure and constant volume respectively, then
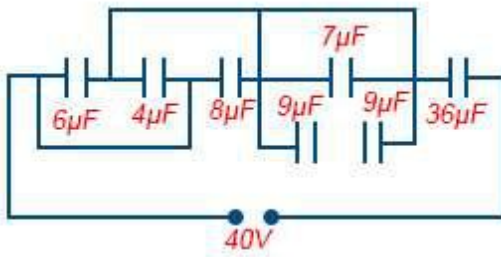
A) $C_p - C_v = \frac{R}{28}$ **B)** $C_p - C_v = \frac{R}{14}$ **C)** $C_p - C_v = R$ **D)** $C_p - C_v = 28R$

34. Three charges $-q_1$, $+q_2$ and $-q_3$ are placed as shown in the figure. The x-component of the force on $-q_1$ is proportional to
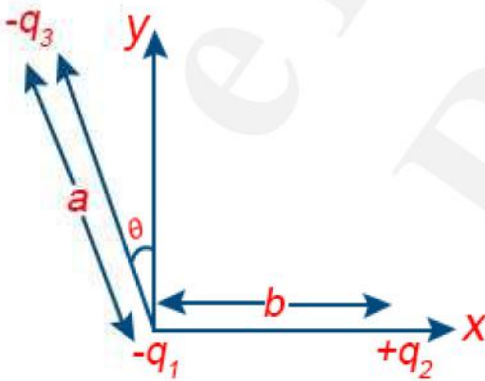
A) $\frac{q_2}{b^2} - \frac{q_3}{a^2} \cos\theta$ **B)** $\frac{q_2}{b^2} + \frac{q_3}{a^2} \sin\theta$ **C)** $\frac{q_2}{b^2} + \frac{q_3}{a^2} \cos\theta$ **D)** $\frac{q_2}{b^2} - \frac{q_3}{a^2} \sin\theta$

35. In the following diagram, the charge and potential difference across 8 μF capacitance will be respectively

A) $320\ \mu\,C, 40\ V$ **B)** $420\ \mu\,C, 50\ V$ **C)** $214\ \mu\,C, 27\ V$ **D)** $360\ \mu\,C, 45\ V$

36. What is the equivalent resistance between A and B? (Each resistor has resistance R)
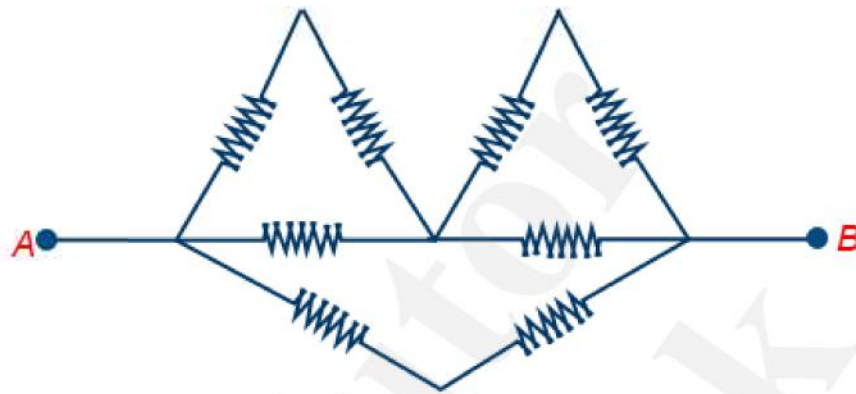
A) $\frac{4R}{3}$ **B)** $\frac{5R}{3}$ **C)** $\frac{4R}{5}$ **D)** $\frac{3R}{4}$

37. The length of a magnet is large compared to its width and breadth. The time period of its oscillation in a vibration magnetometer is 2 s. The magnet is cut along its length into three equal parts and three parts are then placed on each other with their like poles together. The time period of this combination will be

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

38. What will be de-Broglie wavelength of an electron having kinetic energy of 500 eV. Given h = 6.6×10^{-34} JS, e = 1.6×10^{-19} C, $m_e = 9.11 \times 10^{-31}$ kg.

A) $0.5467\ Å$ **B)** $0.5222\ Å$ **C)** $1.5267\ Å$ **D)** $2.555\ Å$

39. Calculate the impact parameter of a 5 MeV alpha particle scattered by $10°$ when it approaches a gold nucleus. Take Z = 79 for gold.

A) 2.6×10^{-13} m   **B)** 3.6×10^{-1} m   **C)** 4.6×10^{-12} m   **D)** 5.6×6^{-1} m

40. The nuclear radius of $_8O^{16}$ is 3×10^{-15} metre. If an atomic mass unit is 1.67×10^{-27} kg, then the nuclear density is approximately :

A) 2.35×10^{17} gm per cm^3 **B)** 2.35×10^{17} kg per $metre^3$ **C)** 2.35×10^{17} gm per $metre^3$

D) 2.35×10^{17} kg per cm^3

41. The figure shows a bridge rectifier with a sinusoidal alternating voltage applied to it, the output terminals P and Q being joined together by a load resistance. If the diode X were removed leaving a break in the circuit, which trace would be seen on a cathode-ray oscilloscope connected across PQ?
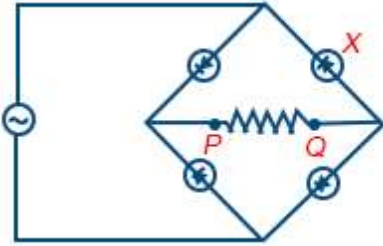
A)   **B)**   **C)**   **D)**

42. The magnetic field due to a straight conductor of uniform cross-section of radius a and carrying a steady current is represented by

A)   **B)**

C)   **D)**
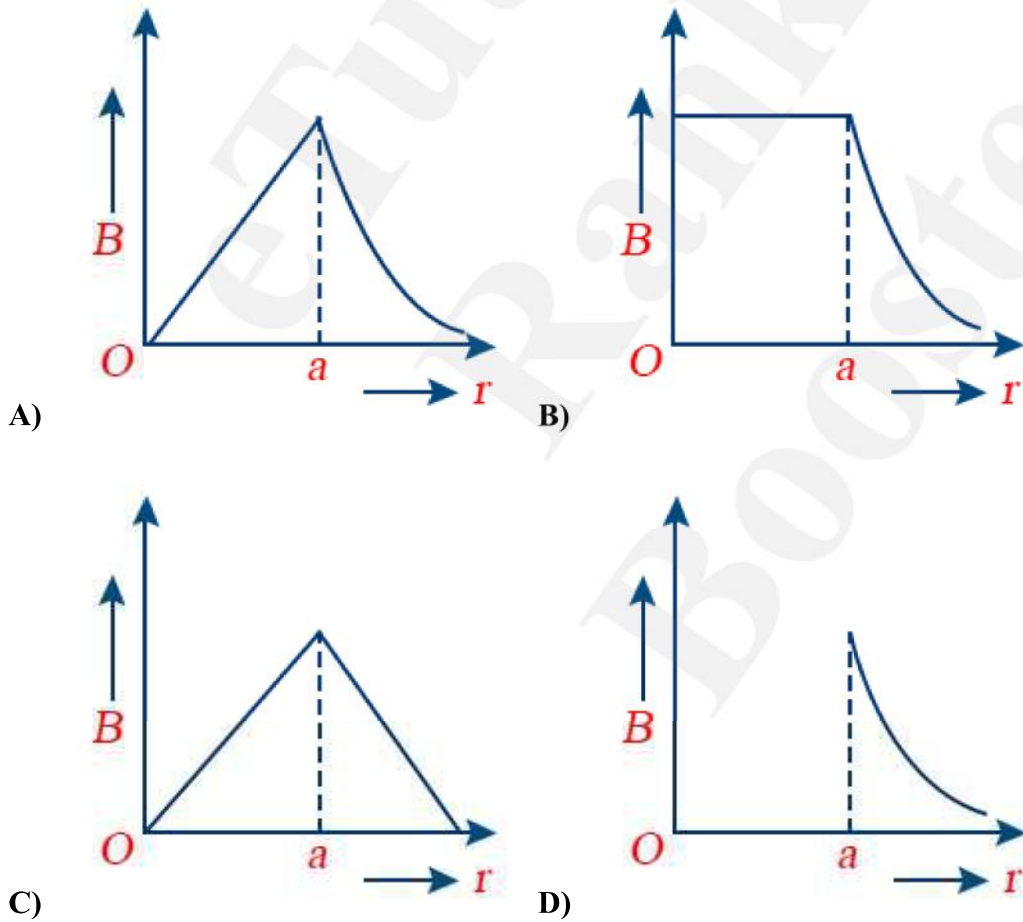
43. A uniformly charged disc of radius R having surface charge density σ is placed in the xy-plane with its centre at the origin. Find the electric field intensity along the Z-axis at a distance Z from origin

A) $E = \frac{\sigma}{2\varepsilon_0}\left(1 - \frac{Z}{\sqrt{(Z^2+R^2)}}\right)$ **B)** $E = \frac{\sigma}{2\varepsilon_0}\left(1 + \frac{Z}{\sqrt{(Z^2+R^2)}}\right)$ **C)** $E = \frac{2\varepsilon_0}{\sigma}\left(\frac{1}{\sqrt{(Z^2+R^2)}} + Z\right)$

D) $E = \frac{\sigma}{2\varepsilon_0}\left(\frac{1}{\sqrt{(Z^2+R^2)}} + \frac{1}{Z^2}\right)$

44. A wooden block performs SHM on a frictionless surface with frequency v_0. The block carries a charge $+Q$ on its surface. If now a uniform electric field E is switched on as shown, then the SHM of the block will be
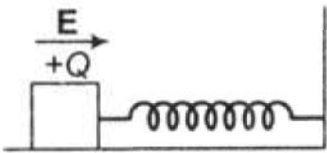
A) Of the same frequency and with shifted mean position

B) Of the same frequency and with the same mean position

C) Of changed frequency and with shifted mean position

D) Of changed frequency and with the same mean position

45. A point P moves in counterclockwise direction on a circular path as shown in the figure. The movement of P is such that it sweeps out a length $s = t^3 + 5$, where s is in metre and t is in second. The radius of the path is $20\,\mathbf{m}$. The
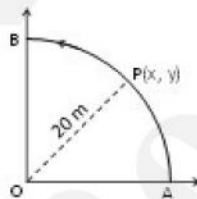
acceleration of P when $t = 2$ s is nearly

A) $13\,\mathrm{ms}^{-2}$ **B)** $12\,\mathrm{ms}^{-2}$ **C)** $7.2\,\mathrm{ms}^{-2}$ **D)** $14\,\mathrm{ms}^{-2}$

46. A SHM is represented by $x = 5\sqrt{2}(\sin 2\pi t + \cos 2\pi t)$. The amplitude of the SHM is

A) 10 cm   **B)** 20 cm   **C)** $5\sqrt{2}cm$ **D)** 50 cm

47. The amplitude of a mechanical wave along the positive x - direction is $y = \frac{1}{(1+x^2)}$ at t = 0 ; and $y = \frac{1}{\left[1+(x-2)^2\right]}$ at t = 8s

Where x and y are in meters. The shape of the wave is constant during its propagation. What is the velocity of the wave?

A) $0.5 \, \text{m}/\text{s}$ **B)** $1.0 \, \text{m}/\text{s}$ **C)** $1.5 \, \text{m}/\text{s}$ **D)** $2.0 \, \text{m}/\text{s}$

48. The mean time period of second's pendulum is 2.00 s and mean absolute error in the time period is 0.05 s. To express maximum estimate of error, the time period should be written as

   A) $(2.00 \pm 0.01)\text{s}$ **B)** $(2.00 + 0.025)\text{s}$ **C)** $(2.00 \pm 0.05)\text{s}$ **D)** $(2.00 \pm 0.10)\text{s}$

49. $y = (\sin x + \cos x)^x$, then $\frac{dy}{dx}$ is

   A) $y(\sin x + \cos x)$ **B)** $y\left\{ \frac{\log y}{x} + \frac{x(\cos x - \sin x)}{\sin x + \cos x} \right\}$ **C)** $y\left(\frac{\log y}{x} + y^2 \right)$ **D)** none of these

50. Which of the following activities involve the utmost expression of passion, talent and intelligence?

   A) literature   **B)** science   **C)** music   **D)** all the above

51. How many hours would make a day if the Earth were rotating at such a high speed that the weight of a body on the equator were zero_____.

52. When a weight of 5 kg is suspended from a copper wire of length 30 m and diameter 0.5 mm, the length of the wire increases by 2.4 cm. If the diameter is doubled, the extension produced is(in cm)_____.

53. 5 moles of an ideal diatomic gas ($\gamma = 1.4$) are heated at a constant pressure. If 280 J of heat energy is supplied to the gas the work done by the gas is _____ J

54. Two spherical vessel of equal volume, are connected by a narrow tube. The apparatus contains an ideal gas at one atmosphere and $300K$. Now if one vessel is immersed in a bath of constant temperature $600K$ and the other in a bath of constant temperature $300K$. Then the common pressure in atm will be_____.
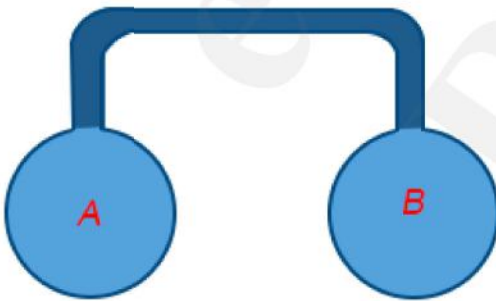
55. Figure shows a square loop of side 0.5m and resistance 10Ω. The magnetic field has a magnitude B = 1.0 T. The work done in pulling the loop out of the field slowly and uniformly in 2.0 second is $n \times 10^{-3}$ J.Then the value of 'n' is ____
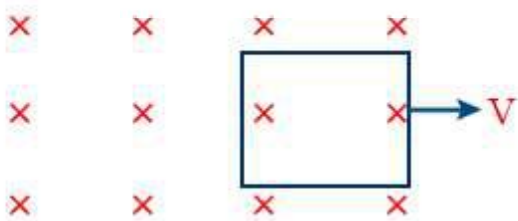

56. In a young's double slit arrangement the distance between the slits is by illuminated by monochromatic light of wavelength $\lambda = 6000°A$ is 1 mm and the distance of the screen from the slits is 60 cm. The least distance of a point on a

screen from the central maxima where the intensity is $3/4^{th}$ the of the maximum intensity is_____ μm.

57. Which state of triply ionised beryllium (Be^{++}) has the same orbital radius as that of the ground state of hydrogen at n is_____

58. The radius of germanium (Ge) nuclide is measured to be twice the radius of $_4Be^9$. The number of nucleons in Ge are_____

59. A body of mass $2M$ splits into four masses $\{m, M-m, m, M-m\}$, which are rearranged to form a square as shown in the figure. The ratio of $\frac{M}{m}$ for which, the gravitational potential energy of the system becomes maximum is $x : 1$. The value of x is......... .
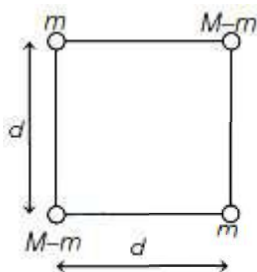
60. In the given figure, an inductor and resistor are connected in series with a battery of emf E volt. $\frac{E^a}{2b}$ **J/s** represents the maximum rate at which the energy is stored in the magnetic field (inductor). The numerical value of $\frac{b}{a}$ will be _____ .
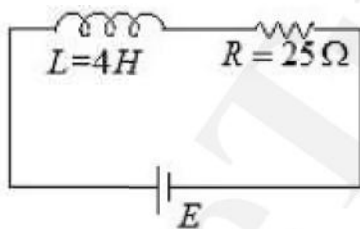
Chemistry

61. The average molecular mass of a mixture of gas containing nitrogen and carbondioxide is 36. The mixture contain 140 g of nitrogen, therefore the amount of CO_2 present in the mixture is

   A) 213 g **B)** 200 g **C)** 313 g **D)** 220 g

62. The first ionization potential of Na, Mg, Al and Si are in the order:

   A) Na > Mg > Al < Si **B)** Na > Mg > Al > Si **C)** Na < Mg < Al < Si **D)** Na < Mg > Al > Si

63. The states of hybridisation of boron and oxygen atoms in boric acid (H_3BO_3) are respectively

   A) sp^2 and sp^2 **B)** sp^2 and sp^3 **C)** sp^3 and sp^2 **D)** sp^3 and sp^3

64. Five moles of a gas is put through a series of changes as shown graphically in a cyclic process the A → B, B → C and C → A respectively are
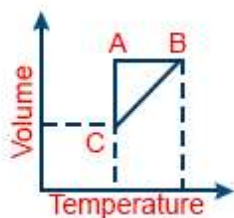
A) Isochoric, Isobaric, Isothermal   **B)** Isobaric, Isochoric, Isothermal   **C)** Isothermal, Isobaric, Isochoric

D) Isochoric, Isothermal, Isobaric

65. In the reaction,
$I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$, equivalent weight of iodine will be equal to

A) twice its molecular weight   **B)** its molecular weight   **C)** ½ its molecular weight   **D)** ¼ its molecular weight

66. When 0.25 g of an organic compounds is heated with HNO_3 and $AgNO_3$ in a carius tube, it gives 0.35 g of silver chloride. The percentage of chlorine in the compound is

A) 36.6%   **B)** 45.3%   **C)** 34.6%   **D)** 54.8%

67. A major alkene (*A*) obtained in the following reaction undergo ozonolysis to give the product.

$$CH_3CHCH_2CH_3 \xrightarrow{\Delta} (A)$$
$$\overset{\oplus}{N}(CH_3)_3OH^-$$

$$\xrightarrow{O_3/\ H_2O_2} \text{product}$$
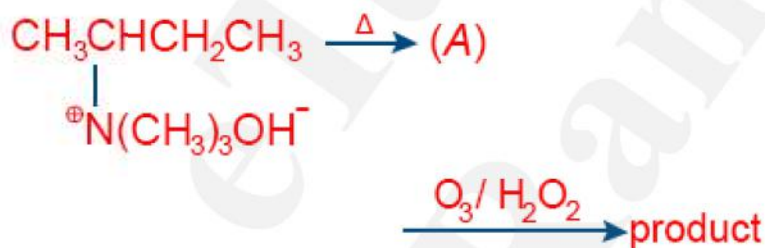
The product obtained is/are identified as

A) ethanal only   **B)** methanal and propanal   **C)** methanal and acetone   **D)** Only acetone

68. An aqueous solution of sugar undergoes acid catalysed hydrolysis. 50 g sugar in 125 mL water rotates the plane of plane polarized light by $+13.1°$ at t = 0. After complete hydrolysis, it shows a rotation of $-3.75°$. The percentage hydrolysis of sugar at time 't' in the same solution having a rotation of 5° is

A) 42 %   **B)** 58 %   **C)** 48 %   **D)** 55 %

69. The complex compound used in the chemotheraphy of cancer is

A) cis-$[Pt^{IV}(NH_3)_2 Cl_4]$ **B)** trans-$[Pt^{II}(NH_3)_2 Cl_2]$ **C)** cis-$[Pt^{IV}(NH_3)_4 Cl_2] Cl_2$ **D)** cis-$[Pt^{II}(NH_3)_2 Cl_2]$

70. A compound A of formula $C_3H_6Cl_2$ on reaction with alkali can give B of formula C_3H_6O or C of formula C_3H_4. B on oxidation gives a compound of the formula $C_3H_6O_2$. C with dilute H_2SO_4 containing Hg^{2+} ion gives D of formula

C_3H_6O, which with bromine and NaOH gives the sodium salt of $C_2H_4O_2$. Then A is

A) $CH_3CH_2CHCl_2$ **B)** $CH_2CCl_2CH_3$ **C)** $CH_2ClCH_2CH_2Cl$ **D)** $CH_3CHClCH_2Cl$

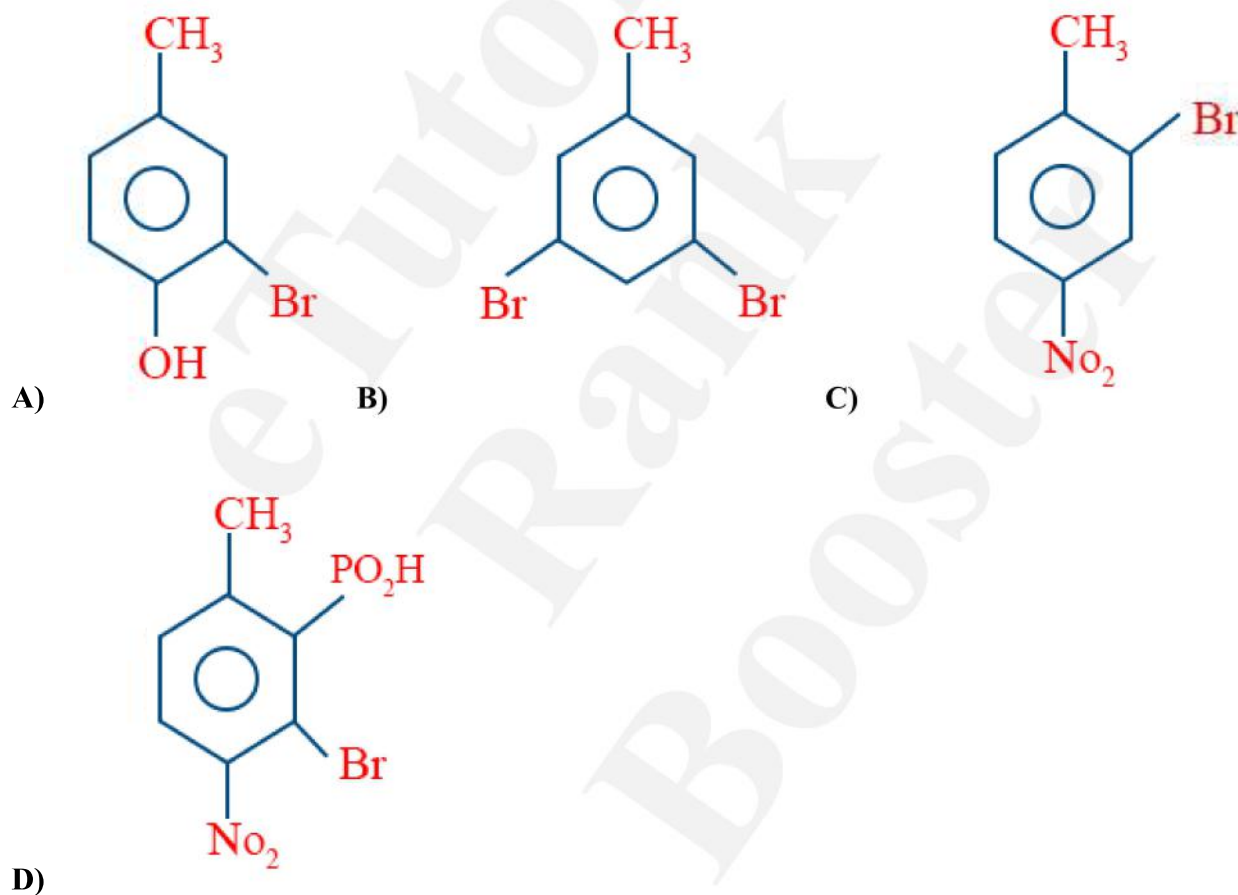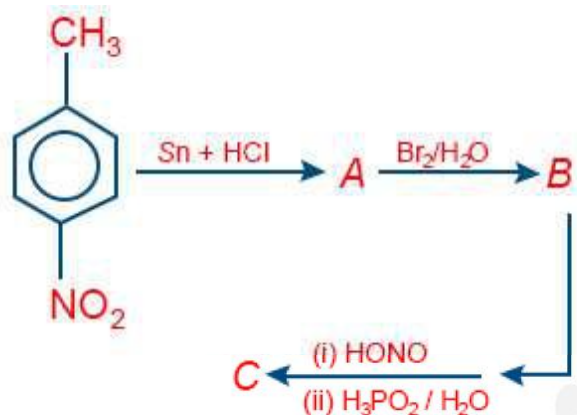71.
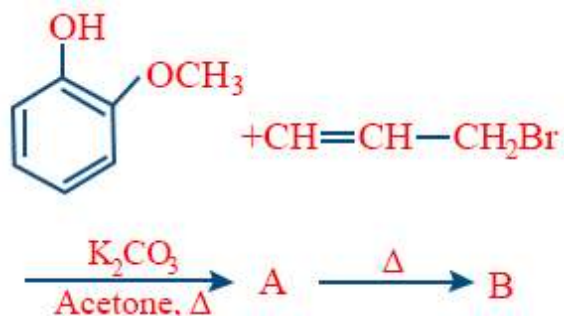
The structure of product B is given as

72. Which of the following compounds will give this product on ozonolysis?

A) I, II IV **B)** I, II, III **C)** I, II **D)** II, IV

73. The final product *C* obtained in the following sequence of reactions

A) B) C)

D)

74. (i) Chlorobenzene and (ii) benzene hexachloride are obtained from benzene by the reaction of chlorine, in the presence of

A) (i) Direct sunlight and (ii) anhydrous $AlCl_3$ **B)** (i) Sodium hydroxide and (ii) sulphuric acid

E)

C) (i) Ultraviolet light and (ii) anhydrous $FeCl_3$ **D)** (i) Anhydrous $AlCl_3$ and (ii) direct sunlight

75. Which one of the following sets of quantum numbers represents an impossible arrangement?

A)

n	l	m	s
3	2	-2	1/2

B)

n	l	m	s
4	0	0	1/2

C)

n	l	m	s
3	2	-3	1/2

D)

n	l	m	s
5	3	0	-1/2

76. $AgNO_3$ (aq) was added to an aqueous KCl solution gradually and the conductivity of the solution was measured. The plot of conductance (Λ) versus the volume of $AgNO_3$ is

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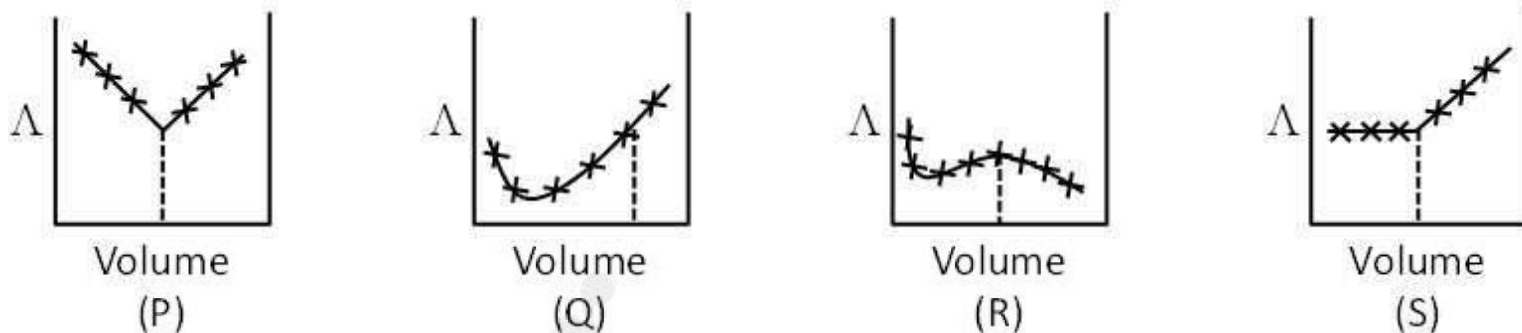
A) (P) **B)** (Q) **C)** (R) **D)** (S)

77. A **5%** solution of cane sugar (molar mass 342) is isotonic with 1% of a solution of an unknown solute. The molar mass of unknown solute in g.mol is

A) 136.2 **B)** 171.2 **C)** 68.4 **D)** 34.2

78. F_2 is a stronger oxidizing agent than Cl_2 in aqueous solution.

This is attributed to many factors except

A) Heat of dissociation **B)** Electron affinity **C)** Ionisational potential **D)** Heat of hydration

79. The bonds present in the structure of dichromate ion are

A) Four equivalent Cr - O bonds only **B)** Six equivalent $Cr - O$ bonds and one $O - O$ bond

C) Six equivalent $Cr - O$ bonds and one $Cr - Cr$ bond

D) Six equivalent $Cr - O$ bonds and one $Cr - O - Cr$ bond

80. Compare vitamin List I with its deficiency disease List II.

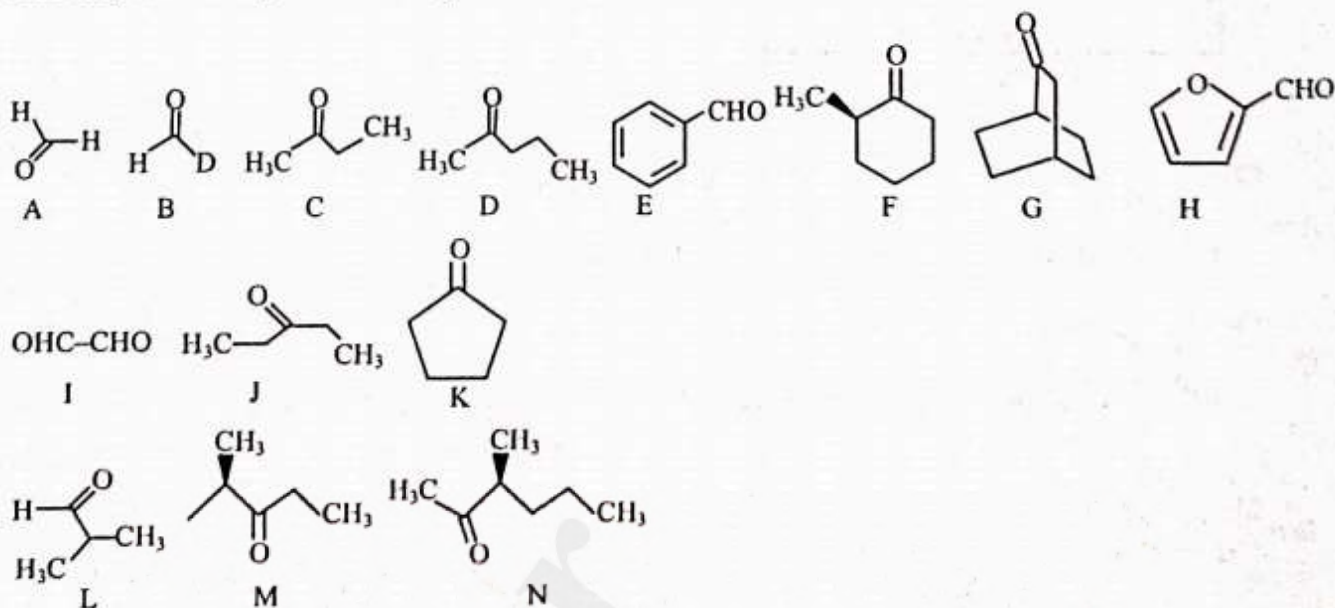| List-I	List-II
A. Vitamin-B_{12}	1. Sterility
B. Vitamin-B_6	2. Hemorrhagic conditions
C. Vitamin-E	3. Pernicious anaemia
D. Vitamin-K	4. Skin disease

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

81. A Hydrated salt $CaCl_2$ X H_2O undergoes 49.32% loss in weight on heating and becomes anhydrous. The value of 'X' will be

82. 1 mole of an ideal gas is allowed to expand reversibly and adiabatically from a temperature of 27°C. The work done is 3 kJ. The final temperature of the gas is equal to _____ K. ($Cv = 20$ J mole^{-1} l^{-1})

83. Number of isomers of molecular formula $C_2H_2Br_2$ are

84. In a zero-order reaction, 47.5% of the reactant remains at the end of 2.5 hours. The amount of reactant consumed in one hour is _____ %.

85. The possible numbers of isomers for the complex $[MCl_2 Br_2] SO_4$ will be _____.

86. The solubility product (K_{sp}) of the sparingly soluble salt (MX) at 298 K is 2.50×10^{-9}. The solubility of the salt at this temperature is $x \times 10^{-5}$ mol L^{-1}. The value of x is_____.

87. A sample of 2.5 moles of N_2H_4 loses 25 moles of electrons on being converted to a new compound **X**. Assuming that there is no loss of nitrogen in the formation of the new compound, what is the oxidation number of nitrogen in compound 'X'?

88. Among the following oxides, how many amphoteric? $CO_2, PbO_2, GeO_2, B_2O_2, Al_2O\ Tl_2O_3, Ga_2O_3, SiO_2, SnO_2$

89. How many of the following can be prepared as a major product in williamson synthesis (Etherification)

$CH_3 - O - CH_3$

$CH_3 - O - C_2H_5$

$CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - O - CH_3$
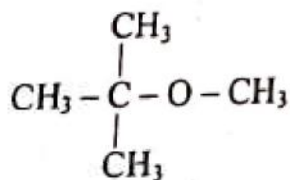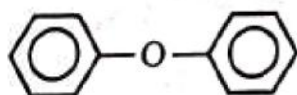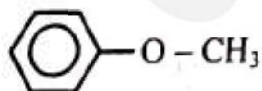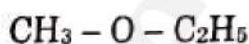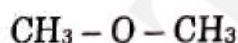
90. **Identify that compounds that give Cannizaro reaction**

Print