CLASS : XII MATHEMATICS

1 **The relation R defined on the set N of natural numbers by $xRy \Leftrightarrow 2x^2 - 3xy + y^2 = 0$ is:**

(A) symmetric but not reflexive (B) only symmetric

(C) not symmetric but reflexive (D) transitive

2 **If** $\begin{pmatrix} 1 & -\tan\theta \\ \tan\theta & 1 \end{pmatrix}\begin{pmatrix} 1 & \tan\theta \\ -\tan\theta & 1 \end{pmatrix}^{-1} = \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ **then:**

(A) $a = b = 1$ (B) $a = \cos 2\theta$, $b = \sin 2\theta$

(C) $a = \sin 2\theta$, $b = \cos 2\theta$ (D) $a = 1$, $b = \sin 2\theta$

3 **Let** $f(x) = \begin{vmatrix} \cos x & x & 1 \\ 2\sin x & x^2 & 2x \\ \tan x & x & 2 \end{vmatrix}$ **then** $\lim_{x\to 0} \frac{f(x)}{x^2}$ **is equal to:**

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

4 **If** $f(x) = \lim_{n\to\infty} (\sin x)^{2n}$, **then 'f' is:**

(A) continuous at $x = \pi$ (B) discontinuous at $x = \frac{\pi}{2}$

(C) discontinuous at $x = -\frac{\pi}{2}$ (D) All of the above

5 **Let** $f(x) = \begin{cases} |x^2 - 2| & ; \quad -1 \le x < \sqrt{3} \\ \frac{x}{\sqrt{3}} & ; \quad \sqrt{3} \le x < 2\sqrt{3} \\ 3 - x & ; \quad 2\sqrt{3} \le x \le 4 \end{cases}$

Then the points where f(x) takes maximum and minimum values are:

(A) 1, 4 (B) 0, 4 (C) 2, 4 (D) 4, 3

6 **If** $\int f(x)dx = f(x)$, **then** $\int \{f(x)\}^2 dx$ **is equal to:**

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

7 If the papers of 4 students can be checked by any one of the 7 teachers, then the probability that all the 4 papers are checked by exactly 2 teachers is:

(A) $\frac{2}{7}$ (B) $\frac{12}{47}$ (C) $\frac{32}{343}$ (D) $\frac{6}{49}$

8 A tetrahedron has vertices O (0, 0, 0), A (1, 2, 1), B (2, 1, 3) and C (–1, 1, 2). The angle between the faces OAB and ABC is:

(A) $\cos^{-1}\left(\frac{19}{35}\right)$ (B) $\cos^{-1}\left(\frac{17}{31}\right)$ (C) 30° (D) 90°

9 The area bounded by the curve $y = f(x)$, $y = x$ and the lines $x = 1$, $x = t$ is $\left(t + \sqrt{1+t^2}\right) - \sqrt{2} - 1$ sq. units for all $t > 1$. If $f(x)$ satisfying $f(x) > x$ for all $x > 1$, then $f(x)$ is equal to:

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

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

10 The differential equation representing the family of the curves $y^2 = 2c\left(x + \sqrt{c}\right)$, where 'c' is a positive parameter, is of:

(A) order 1, degree 3 (B) order 2, degree 2
(C) order 3, degree 3 (D) order 4, degree 4

11 Let $f(x) = \frac{x - [x]}{1 + x - [x]}$, $x \in R$, then the range of f is:

(A) [0, 1] (B) $\left[0, \frac{1}{2}\right]$ (C) $\left[0, \frac{1}{2}\right)$ (D) (0, 1)

12 Value of $\sum_{r=0}^{\infty} \tan^{-1}\left(\frac{1}{1+r+r^2}\right)$ is equal to:

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

13 If $A^k = 0$, for some value of k, $(I - A)^p = I + A + A^2 + ... + A^{k-1}$, thus p is:

(A is nilpotent with index k)

(A) –1 (B) –2 (C) –3 (D) –4

14 Which of the following could not be true if $f''(x) = x^{-1/3}$?

(A) $f(x) = \frac{3}{2}x^{2/3} - 3$ (B) $f(x) = \frac{9}{10}x^{5/3} - 7$

(C) $f'''(x) = -\frac{1}{3}x^{-4/3}$ (D) $f'(x) = \frac{3}{2}x^{2/3} + 6$

15 Let $f''(x) > 0 \ \forall \ x \in R$ and $g(x) = f(2 - x) + f(4 + x)$, then g(x) is increasing in:

(A) $(-\infty, -1)$ (B) $(-\infty, 0)$

(C) $(-1, \infty)$ (D) $(-2, \infty)$

16 Of the 25 questions in a unit, a student has worked out only 20. In a sessional test of that unit, two questions were asked by the teacher. The probability that the student can solve both the questions correctly, is:

(A) 8/25 (B) 17/25 (C) 9/10 (D) 19/30

17 The volume of the tetraheron whose vertices are with position vectors $\hat{i} - 6\hat{j} + 10\hat{k}$, $-\hat{i} - 3\hat{j} + 7\hat{k}$, $5\hat{i} - \hat{j} + \lambda\hat{k}$ and $7\hat{i} - 4\hat{j} + 7\hat{k}$ is 11 cubic unit if λ equals:

(A) -3 (B) 3 (C) 7 (D) -1

18 If for the differential equation $y^1 = \frac{y}{x} + \phi\left(\frac{x}{y}\right)$ the general solution is $y = \frac{x}{\log|cx|}$, then $\phi\left(\frac{x}{y}\right)$ is given by:

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

19 Let $\mathbf{a} = \mathbf{i} + 2\mathbf{j} + \mathbf{k}$, $\mathbf{b} = \mathbf{i} - \mathbf{j} + \mathbf{k}$ and $\mathbf{c} = \mathbf{i} + \mathbf{j} - \mathbf{k}$. A vector in the plane of a and b whose projection on c is $\frac{1}{\sqrt{3}}$ is:

(A) $-4\mathbf{i} + \mathbf{j} - 4\mathbf{k}$ (B) $3\mathbf{i} + \mathbf{j} - 3\mathbf{k}$

(C) $\mathbf{i} + \mathbf{j} - 2\mathbf{k}$ (D) $4\mathbf{i} + \mathbf{j} - 4\mathbf{k}$

20 If $\vec{a}$ and $\vec{b}$ are unit vectors and θ is the angle between them, then $\left|\frac{\vec{a} - \vec{b}}{2}\right|$ is:

(A) $\sin\frac{\theta}{2}$ (B) $\sin\theta$ (C) $2\sin\theta$ (D) $\sin 2\theta$

21 If $f(t) = \sqrt{t}$, $g(t) = t/4$ and $h(t) = 4t - 8$, then the formula for g (f (h (t))) will be:

(A) $\sqrt{\frac{t-2}{4}}$ (B) $2\sqrt{t-8}$

(C) $\sqrt{\frac{(4t-8)}{4}}$ (D) $\sqrt{\frac{(t-8)}{4}}$

22 If $A = 2\tan^{-1}\left(2\sqrt{2}-1\right)$ and $B = 3\sin^{-1}\left(\frac{1}{3}\right) + \sin^{-1}\left(\frac{3}{5}\right)$, then:

(A) A = B (B) A < B

(C) A > B (D) Both A and B

23 The coefficient of x in the expansion of

$$\begin{vmatrix} (1+x)^{22} & (1+x)^{44} & (1+x)^{66} \\ (1+x)^{33} & (1+x)^{66} & (1+x)^{99} \\ (1+x)^{44} & (1+x)^{88} & (1+x)^{144} \end{vmatrix}$$ is:

(A) 22 (B) –22 (C) 0 (D) 1

24 If $f(x) = \dfrac{1}{(x-1)(x-2)}$ and $g(x) = \dfrac{1}{x^2}$, then points of discontinuity of $f(g(x))$ are:

(A) $\left\{-1, 0, 1, \dfrac{1}{\sqrt{2}}\right\}$ (B) $\left\{-\dfrac{1}{\sqrt{2}}, -1, 0, 1, \dfrac{1}{\sqrt{2}}\right\}$

(C) $\{0, 1\}$ (D) $\left\{0, 1, \dfrac{1}{\sqrt{2}}\right\}$

25 If $k = e^{2007}$, then the value of $I = \int_1^k \dfrac{\pi \cos(\pi \log x)}{x} dx$ is:

(A) 0 (B) $-\pi$ (C) $\dfrac{\pi}{e}$ (D) $2007\ \pi$

26 A bag contains 80 envelopes of which 30 are airmail and the rest are ordinary. Out of the 80 envelopes in the bag 48 are stamped and the rest are unstamped. There are 20 unstamped ordinary envelopes in the bag. If one envelope is chosen at random from the bag then the probabilities that this is an unstamped airmail envelope is:

(A) $\dfrac{12}{80}$ (B) $\dfrac{18}{80}$ (C) $\dfrac{20}{80}$ (D) $\dfrac{30}{80}$

27 Solution of differential equation

$(x \cos x - \sin x)\, dx = \dfrac{x}{y} \sin x\, dy$ is:

(A) $\sin x = \ln |xy| + c$ (B) $\ln \left|\dfrac{\sin x}{x}\right| = y + c$

(C) $\left|\dfrac{\sin x}{xy}\right| = c$ (D) $\left|\dfrac{\cos x}{xy}\right| = c$

28 Consider the parallelopiped with sides $a = 3i + 2j + k$, $b = i + j + 2k$ and $c = i + 3j + 3k$ then the angle between 'a' and the plane containing the face determined by 'b' and 'c' is:

(A) $\sin^{-1} 1/3$ (B) $\cos^{-1} 9/14$ (C) $\sin^{-1} 9/14$ (D) $\sin^{-1} 2/3$

29 If $|a| = 2$, $|b| = 3$ $|c| = 4$ and $a + b + c = 0$ then the value of $b.c + c.a + a.b$ is equal to:

(A) 19/2 (B) – 19/2 (C) 29/2 (D) – 29/2

30 If the pair of lines represented by the equation $6x^2 + 17xy + 12y^2 + 22x + 31y + 20 = 0$ be $2x + 3y + p = 0$ and $3x + 4y + q = 0$, then:

(A) $p + q = 19$ (B) $p^2 + q^2 = 41$ (C) $3p - 2q = 22$ (D) $4p - 3q = 31$

31 If $I = \int_8^{15} \frac{dx}{(x-3)\sqrt{x+1}}$, then I equals:

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

32 If $a\sin^{-1}x - b\cos^{-1}x = c$, then $a\sin^{-1}x + b\cos^{-1}x$ is equal to:

(A) 0 (B) $\frac{\pi ab + c(b-a)}{a+b}$ (C) $\frac{\pi}{2}$ (D) $\frac{\pi ab + c(a-b)}{a+b}$

33 The inverse of a skew symmetric matrix of odd order is:

(A) a symmetric matrix (B) a skew-symmetric matrix
(C) diagonal matrix (D) does not exist

34 If $\begin{vmatrix} x & 3 & 6 \\ 3 & 6 & x \\ 6 & x & 3 \end{vmatrix} = \begin{vmatrix} 2 & x & 7 \\ x & 7 & 2 \\ 7 & 2 & x \end{vmatrix} = \begin{vmatrix} 4 & 5 & x \\ 5 & x & 4 \\ x & 4 & 5 \end{vmatrix} = 0$, then x is equal to:

(A) 9 (B) –9 (C) 0 (D) 1

35 If $\cos^{-1}\left(\frac{x^2 - y^2}{x^2 + y^2}\right) = \log a$, then $\frac{dy}{dx}$ is equal to:

(A) $\frac{y}{x}$ (B) $\frac{x}{y}$ (C) $\frac{x^2}{y^2}$ (D) $\frac{y^2}{x^2}$

36 The point(s) on the curve $y^3 + 3x^2 = 12y$ where the tangent is vertical is/are:

(A) $\left(\pm 4/\sqrt{3}, -2\right)$ (B) $\left(\pm\sqrt{\frac{11}{3}}, 1\right)$

(C) (0, 0) (D) $\left(\pm\frac{4}{\sqrt{3}}, 2\right)$

37 If $I = \int \frac{5+3x}{\sqrt{(x-1)(x+2)}}\,dx$, then I equals:

(A) $3\sqrt{(x-1)(x+2)} + \frac{7}{2}\log\left|x+\frac{1}{2}+\sqrt{(x-1)(x+2)}\right| + c$

(B) $3\sqrt{x^2-x-2} + \frac{7}{2}\log\left|x+\frac{1}{2}+\sqrt{x^2-x-2}\right| + c$

(C) $3\log\left|x+\frac{1}{2}+\sqrt{(x-1)(x+2)}\right| + c$

(D) $3\sin^{-1}\sqrt{\frac{x-1}{x+2}} + c$

38 **Area bounded by the curve y = (x - 1) (x - 2) (x - 3) and x-axis lying between the ordinates x = 0 and x = 3 is equal to:**

(A) $\frac{9}{4}$ sq. unit (B) $\frac{11}{4}$ sq.unit

(C) $\frac{13}{4}$ sq. unit (D) $\frac{15}{4}$ sq.unit

39 **If the foot of the perpendicular from the origin to a plane is (a, b, c), then the equation of the plane is:**

(A) $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=3$ (B) $ax + by + cz = 3$

(C) $ax + by + cz = a^2 + b^2 + c^2$ (D) $ax + by + cz = a + b + c$

40 **Let us define the length of a vector $a\hat{i} + b\hat{j} + c\hat{k}$ as $|a| + |b| + |c|$. This definition coincides with the usual definition of length of a vector $a\hat{i} + b\hat{j} + c\hat{k}$ iff :**

(A) $a = b = c = 0$ (B) any two of a, b and c are zero

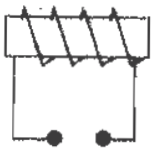
(C) $a + b + c = 0$ (D) any one of a, b and c is zero

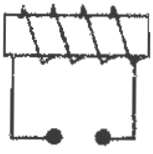
CLASS : XII PHYSICS

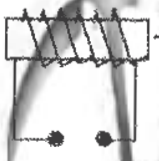
41 **Eight dipoles with 'q' as the magnitude of charges is placed in a cube. What will be the total electric flux coming out of the cube?**

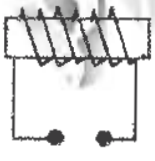
(A) $\frac{16q}{\epsilon_0}$ (B) $\frac{8q}{\epsilon_0}$ (C) zero (D) $\frac{q}{\epsilon_0}$

42 **The electromagnets shown below are made of same length of wires. Which electromagnet is the strongest?**

(A) 

(B) 

(C) 

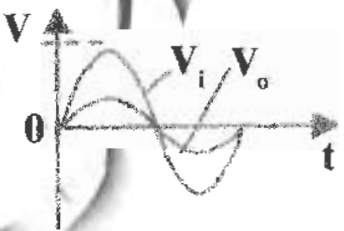
(D) 

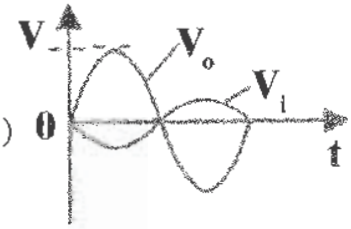
43 **Which of the following are installed on the earth's ground?**

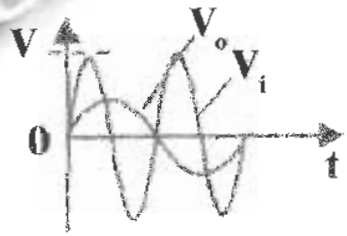
I.	Optical telescopes
II.	X-ray astronomy
III.	Radio telescopes

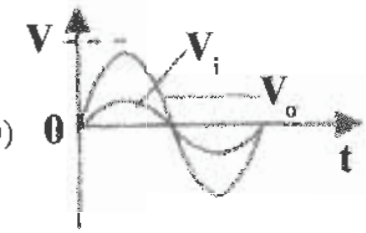
(A) I and II only (B) II and III only
(C) III and I only (D) I, II and III

44 **The input voltage of a step-up transformer is V_i and its output voltage is V_o. Which graph shows correctly V_i and V_o?**

(A) 

(B) 

(C) 

(D) 

45 **A ray of light in a liquid of refractive index 1.6, approaches the boundary surface between the liquid and air at an angle of incidence i where sini = 0.7. Which of the following statements is *true* about the behaviour of the light?**

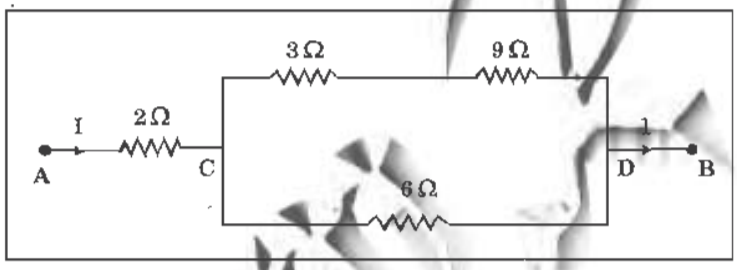
(A) It is impossible to predict the behaviour of the light ray on the basis of the information supplied

(B) The sine of the angle of refraction of the emergent ray will be less than 0.7

(C) The ray will be internally reflected

(D) The sine of the angle of refraction of the emergent ray will be greater than 0.7.

46 **Look at the circuit given below.**



The resistance 6 Ω develops 24 cal s^{-1} due to the current flowing through it. Find the rate of heat developed in 2 Ω resistance?

(A) 2 cal s^{-1} (B) 18 cal s^{-1} (C) 8 cal s^{-1} (D) 24 cal s^{-1}

47 **Find the binding energy of the least strongly bound neutron in a $_6C^{13}$ nucleus. (Given atomic mass of $_6C^{13}$ = 13.00335 U, Atomic mass of $_6C^{12}$ = 12 U, the mass of a neutron = 1.00867 U, 1 U = 931 MeV)**

(A) 3.4 MeV (B) 4.953 MeV

(C) 6.879 MeV (D) 1.84 MeV

48 **Which gate can act as a building block for the digital circuits?**

(A) OR (B) AND (C) NOT (D) NAND

49 **Which of the following statements is *not true*?**

(A) In Fresnel diffraction, both source and screen are near the aperture.

(B) In Fresnel diffraction, ray from the source and ray to the screen are considered to be parallel.

(C) In Fraunhoffer diffraction, both light source and screen are very far from the aperture.

(D) In Fraunhoffer diffraction, rays incident on the aperture and leaving the aperture are parallel.

50 **Identify which one of the following signals is digital?**

(A) Pulse code modulation

(B) Pulse position modulation

(C) Pulse amplitude modulation

(D) Pulse width modulation

51 **Two identical cells whether joined in series or in parallel have the same current through an external resistance of 4 Ω. The internal resistance of each cell is:**

(A) 2 Ω (B) 4 Ω

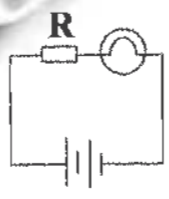
(C) 0.5 Ω (D) 0.25 Ω

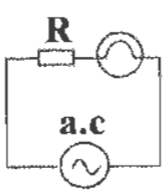
52 **The shortest wavelength X-rays photon emitted when the X-rays tube is subjected to 50 kV is :**

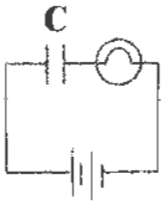
(A) 2.5×10^{-12} m (B) 5×10^{-11} m

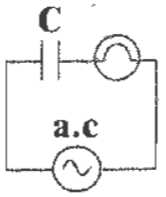
(C) 7.5×10^{-11} m (D) 10×10^{-11} m

53 **In which of the following circuits the bulb does not light up?**

(A) 

(B) 

(C) 

(D) 

54 **Eight mercury droplets having a radius of 1 mm and a charge of 0.066 pC each merge to form one droplet. Its potential is:**

(A) 2.4 V (B) 1.2 V (C) 3.6 V (D) 4.8 V

55 **The current gain of a transistor in a common emitter circuit is 30. Find the ratio of emitter current to base current?**

(A) 30 : 1 (B) 31 : 1 (C) 32 : 1 (D) 1 : 1

56 **In the Young's double slit experiment, the intensity at the screen due to the two slits are 9 units and 1 unit, respectively. Find the intensity ratio between bright and dark fringes.**

(A) 16 : 1 (B) 3 : 2 (C) 4 : 1 (D) 2 : 5

57 **A prism of refractive index μ and apex angle A is placed in minimum deviation position. If the angle of minimum deviation is equal to the angle A, then what is the value of A?**

(A) $2\cos^{-1}\left(\frac{\mu}{2}\right)$ (B) $2\cos^{-1}\left(\frac{\sqrt{\mu}}{2}\right)$

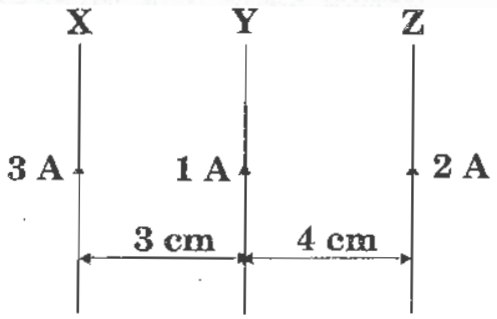
(C) $2\cos^{-1}\left[\frac{1-\mu^2}{2}\right]$ (D) $2\cos^{-1}\left[\frac{\sqrt{1-\mu^2}}{2}\right]$

58 **Which layer of the ionosphere disappears at night?**

(A) F_1 – Layer (B) E – Layer

(C) D – Layer (D) F_2 – Layer

59 **In the figure given below three long straight and parallel conductors X, Y and Z carrying currents of 3 A, 1 A and 2 A respectively.**



If the length of the wire Y is 0.5 m, then what force is experienced by it?

(A) 10^{-5} N from left to right (B) 10^{-5} N from right to left

(C) 5×10^{-6} N from left to right (D) 5×10^{-6} N from right to left

60 **According to Maxwell's hypothesis a changing electric field gives rise to:**

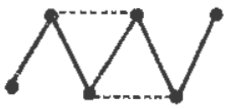
(A) changing magnetic field (B) changing electric field

(C) an e.m.f. (D) gravitational field

61 **If x and y are the distance of an object and its image from the focus of a spherical mirror (focal length f), then identify the correct relation between x, y and f.**

(A) $xy = f$ (B) $xy = f^2$ (C) $xy = f^3$ (D) $\frac{x}{y} = f$

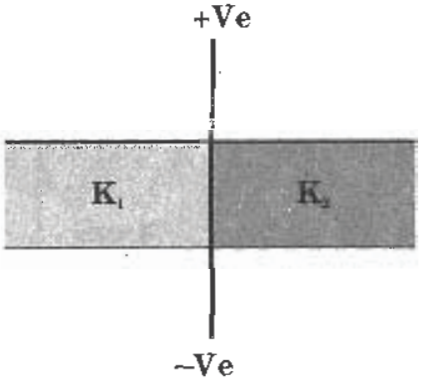
62 **What will be the change in the resistance of a circuit consisting of 5 similar conductors if two similar conductors are added as shown in figure.**



If R_1 and R_2 are resistances in two cases respectively, then find the ratio of R_2 to R_1.

(A) 7 : 5 (B) 2 : 5 (C) 1 : 2 (D) 3 : 5

63 **A parallel plate condenser with plate A is filled with two dielectrics K_1 and K_2 occupying equal space lengthwise as shown.**



If the separation between the two plates is 't' for each dielectric, then find the capacity C.

(A) $C = \frac{\epsilon_0 A(K_1 + K_2)}{t}$ (B) $C = \frac{\epsilon_0 A(K_1 + K_2)}{2t}$

(C) $C = \frac{2\epsilon_0 A(K_1 + K_2)}{t}$ (D) $C = \frac{\epsilon_0 A(K_1 - K_2)}{2t}$

64 **A horizontal wire AB of mass 3×10^{-3} kg and length one metre carries a current of 9.8 A. The wire lies in the magnetic field acting perpendicular to the wire. What is the magnitude of the field which can support the weight of the wire?**

(A) 3×10^{-3} T (B) $3\times10^{-3}\times9.8$ T

(C) $\frac{3\times10^{-3}}{9.8}$ T (D) $\frac{1}{3\times10^{-3}}$ T

65 **Which of the following statements regarding zener diode is *true*?**

(A) A zener can operate only in the forward biased condition

(B) Zener breakdown occurs when applied voltage is less than zener breakdown voltage

(C) The current in the zener region is in opposite direction to that of the forward biased diode

(D) Zener diode is used as a half wave rectifier

CLASS : XII CHEMISTRY

66 **In a face centered cubic arrangement of atoms A and B, atoms A are present at the corners while atoms B are present at the face centres. One of the A atom is missed from one corner in the unit cell. The simplest formula of the compound is:**

(A) A_7B_3 (B) AB_3 (C) A_7B_{24} (D) $A_{7/8}B_5$

67 **Which of the following statements is/are correct ?**

(A) Frenkel defect is usually favoured by a very small difference in the size of cation and anion.

(B) In Frenkel defect excess cations occupy interstitial sites.

(C) Trapping of electron in the lattice leads to the formation of F - centre.

(D) Schottky defects have no effects on the physical properties of solids.

68 **The freezing point of a solution containing 0.2 g of acetic acid in 20 g of benzene is lowered by 0.45 °C. Calculate the degree of association of acetic acid in benzene. Assume acetic acid dimerizes in benzene.** *(K_f for benzene = 5.12 K mol^{-1} kg).*

(A) 0.945 (B) 0.523 (C) 0.122 (D) 0.678

69 **The following are the standard reduction potentials of the half electrodes:**

i.	$Zn^{+2} + 2e^- \longrightarrow$	$Zn_{(s)}$;	$E^0 = -0.762$ V
ii.	$Fe^{+3} + e^- \longrightarrow$	$Fe^{+2}_{(s)}$;	$E^0 = +0.77$ V
iii.	$2H^+ + 2e^- \longrightarrow$	$H_{2(s)}$;	$E^0 = 0.000$ V
iv.	$Cr^{+3} + 3e^- \longrightarrow$	$Cr_{(s)}$;	$E^0 = -0.740$ V

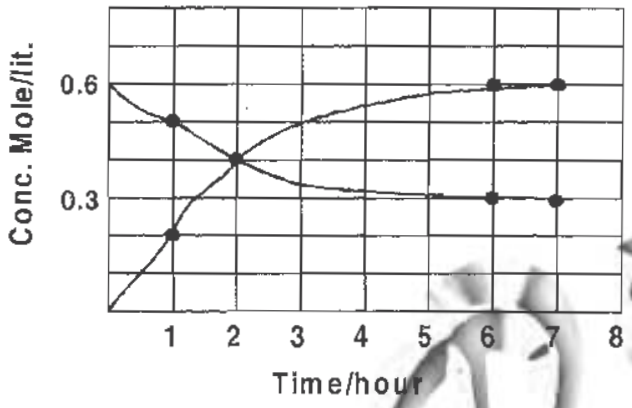
Which is the strongest reducing agent?

(A) Cr (B) Zn (C) H_2 (D) Fe^{+2}

70 **The specific conductivity of N/10 KCl solution at 20 °C is 0.0212 ohm^{-1} cm^{-1} and the resistance of the cell containing this solution at 20 °C is 55 ohm. Calculate the cell constant.**

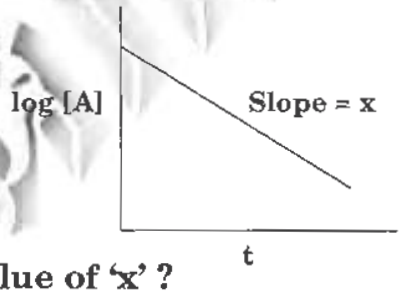
(A) 3.324 cm^{-1} (B) 1.166 cm^{-1} (C) 4.616 cm^{-1} (D) 2.173 cm^{-1}

71 **A graph representing a reaction $A \rightleftharpoons nb$ with time. Calculate the equilibrium constant and n values.**



	K_C	n
(A)	2.4 mole/lit	2
(B)	1.2 mole/lit^2	1
(C)	2.4 mole/lit^2	1
(D)	1.2 mole/lit	2

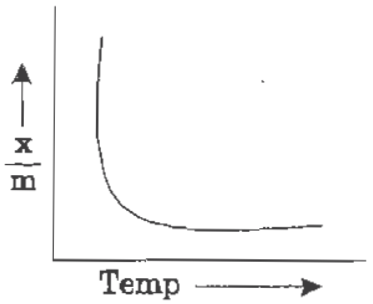
72 **For a first order reaction, the graph of log [A] versus t is given below:**

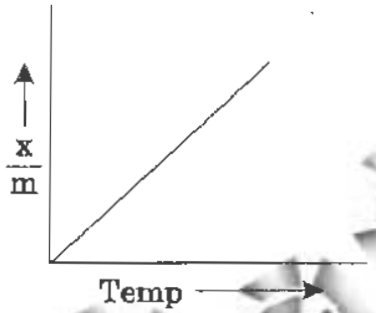


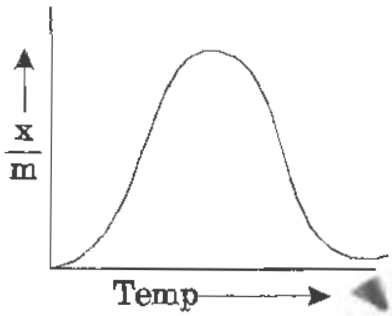
What is the value of 'x' ?

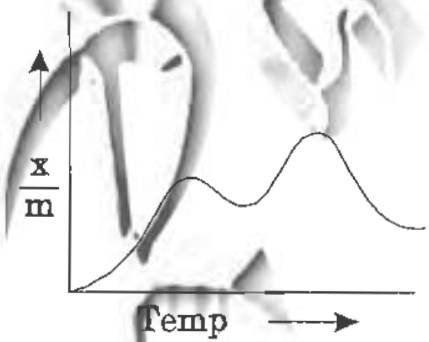
(A) $\frac{0.693}{K}$ (B) $\frac{K}{2.303}$ (C) $-\frac{K}{2.303}$ (D) $\log [A]_0$

73 **Which of the following represents physical adsorption ?**

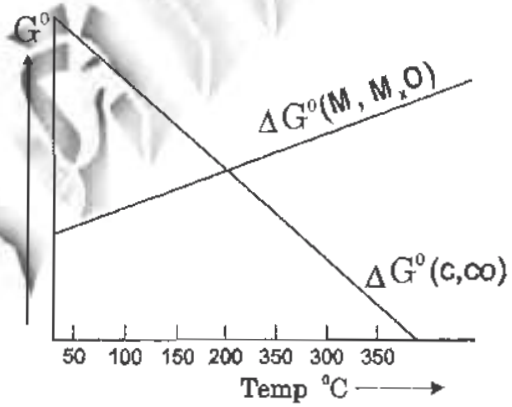
(A) 

(B) 

(C) 

(D) 

74 **Based on following Ellingham diagram, indicate the temperature favourable for the reduction of metal oxide to metal.**



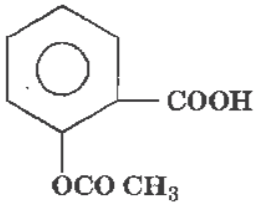
(A) 50 (B) 200 (C) 150 (D) 100

75 **A gas 'X' is passed through water to form a saturated solution. The aqueous solution on treatment with silver nitrate gives a white precipitate. The saturated aqueous solution also dissolves magnesium ribbon with the evolution of a colourless gas 'Y'. Identify 'X' and 'Y' ?**

(A) X = CO_2, Y = Cl_2 (B) X = Cl_2, Y = CO_2

(C) X = Cl_2, Y = H_2 (D) X = H_2, Y = Cl_2

76 **The given compound is used as:**



(A) Antiseptic (B) Antibiotic (C) Analgesic (D) Pesticide

77 **Three compounds are given below.**

I. ClOH II. BrOH III. IOH

Identify the correct order of decreasing acid strength for the given compounds.

(A) I, II, III (B) II, I, III (C) III, II, I (D) I, III, II

78 **Which one of the following statements regarding Helium is *incorrect* ?**

(A) It is used to fill gas balloons instead of hydrogen because it is lighter and non-inflammable.

(B) It is used in gas-cooled nuclear reactors.

(C) It is used to produce and sustain powerful super conducting magnets.

(D) It is used as a cryogenic agent for carrying out experiments at low temperature.

79 **Which of the following does not possess S-S bond ?**

(A) $S_2O_4^{2-}$ (B) $S_2O_5^{2-}$ (C) $S_2O_3^{2-}$ (D) $S_2O_7^{2-}$

80 **When $KMnO_4$ is added to a hot oxalic acid solution, the decolorisation is slow in the beginning, but get accelerated after a while. This is because:**

(A) reaction is exothermic (B) CO_2 is formed as a product

(C) Mn catalyses the reaction (D) Mn^{+2} acts as an auto catalyst

81 ***Assertion*: Both [Pt Cl_2 $(NH_3)_2$] and [Pt $(NH_3)_6$] Cl_4 forms an electrically conducting medium in aqueous solution.**

***Reason*: [Pt $(NH_3)_6$] Cl_4 is a complex compound and furnishes ions in solution, [Pt Cl_2 $(NH_3)_2$] does not furnish ions in solution.**

(A) Both Assertion and Reason are correct, and reason is the correct explanation of Assertion.

(B) Both Assertion and Reason are correct, but reason is not the correct explanation of assertion.

(C) Assertion is correct, Reason is incorrect.

(D) Assertion is incorrect, Reason is correct.

82 **The hybridisation and magnetic moment of a complex compound $[Cr(NH_3)_6]^{3+}$ is:**

	Hybridisation	Magnetic moment
(A)	sp^3	1.73 BM
(B)	$sp^3 d^2$	2.28 BM
(C)	$d^2 sp^3$	3.87 BM
(D)	$d^2 sp^3$	2.28 BM

83 **In the chemical reaction:**

$$CH_3CH_2NH_2 + CHCl_3 + 3KOH \rightarrow (A) + (B) + 3H_2O$$

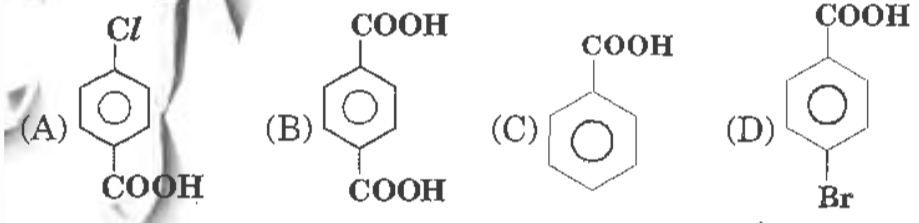
Identify the compounds (A) and (B).

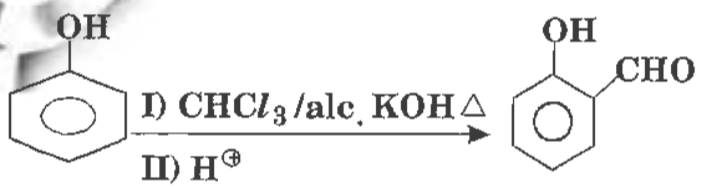
(A) C_2H_5NC and 3 KCl (B) C_2H_5CN and 3 KCl

(C) $CH_3CH_2CONH_2$ and 3 KCl (D) C_2H_5NC and K_2CO_3

84 **Study the reaction given below.**

Identify 'z' in the above reaction.

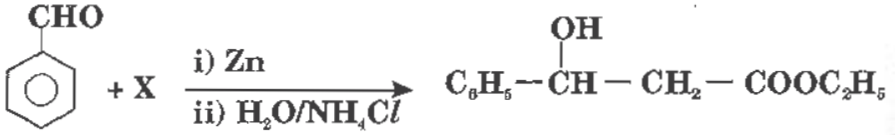


85 

is called:

(A) Gattermann Koch synthesis
(B) Gattermann synthesis
(C) Houben - Hoesch reaction
(D) Reimer - Tiemann reaction

86 **In the given reaction:**



What is 'X' ?

(A) $CH_3-COOC_2H_5$ (B) $CH_3-CH_2-COOC_2H_5$

(C) $Br-CH_2-COOC_2H_5$ (D) $\begin{matrix}Br\\Br\end{matrix}\!\!>\!CH-COOC_2H_5$

87 **Study the given reaction below:**

$$CH_3CH_3 \xleftarrow{B} CH_3COOH \xrightarrow{A} CH_3CH_2OH$$

Identify A and B in the given reaction.

	A	B
(A)	HI + RedP	$LiAlH_4$
(B)	Ni/Δ	$LiAlH_4$
(C)	Pd - $BaSO_4$	Zn + HCl
(D)	$LiAlH_4$	HI + Red P

88 **Which of the following compounds will form primary alcohol with $NaNO_2$/conc. HCl?**

(A) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-NH_2$ (B) $\begin{matrix}CH_3-CH-NH_2\\ \quad\quad|\\ \quad\quad CH_3\end{matrix}$

(C) $CH_3-CH_2-NH_2$ (D) All of the above

89 **Amylose and Cellulose both are linear polymers of glucose. What is the difference between them?**

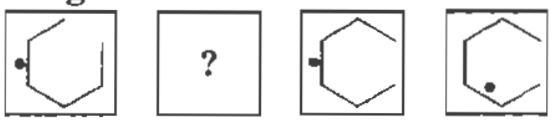
(A) Amylose has β (1 → 4) linkage and cellulose has α(1 → 4) linkage.
(B) Amylose has α(1 → 4) linkage and cellulose has β (1 → 4) linkage.
(C) Amylose has α(1 → 4) linkage and cellulose has α(1 → 6) linkage.
(D) Amylose has β (1 → 4) linkage and cellulose has β (1 → 6) linkage.

90 **Which of the following is an optically inactive amino acid?**

(A) Lactic acid (B) Serine (C) Alanine (D) Glycine

CLASS : XII GENERAL QUESTIONS

91 Complete the given series.



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

92 In a certian code INSTITUTION is written as NOITUTITSNI. How is PERFECTION written in that code?

(A) NOICTEFRED (B) NOTICEFREP
(C) NOITCEFERP (D) NOITCEFREP

93 Complete the given series.

15, 5, 17, 7, 19, 9, 21, ?

(A) 23 (B) 13 (C) 11 (D) 25

94 A very much publicized treatment method "DOTS" is being adopted for the cure of:

(A) Dementia (B) Tetanus (C) Tuberculosis (D) STD's

95 Euthansia (Mercy killing) was first legalized in:

(A) Switzerland (B) Holland (C) France (D) Italy

96 Where is "National Defence Academy" situated in?

(A) New Delhi (B) Khadak vasla (C) Dehradun (D) Pune

97 Who was elected as the permanent president of constituent assembly?

(A) Dr. Sacchidanand Sinha (B) Dr. Rajendra Prasad
(C) Dr. B.R. Ambedkar (D) C. Rajagopalachari

98 To win a Grand-Slam in Tennis, a player has to win:

(A) Australian open, Wimbledon, The French open, The US open
(B) Wimbledon, The French open, The US open
(C) Wimbledon, The French open, Pegas Czeck Open, The US open
(D) Davis cup, Wimbledon, The French open

99 The international court of justice is located at:

(A) Geneva (B) Hague (C) Amsterdam (D) Vienna

100 Who is the Author of an "An Area of Darkness"?

(A) Nirad C. Choudhari (B) Vikram seth
(C) V.S. Naipaul (D) B.C. Chatterjee

KEY FOR THE Q.P.-2011

1.	C	2.	B	3.	D	4.	D	5.	B	6.	A	7.	D	8.	A
9.	A	10.	A	11.	C	12.	A	13.	A	14.	A	15.	C	16.	D
17.	C	18.	D	19.	A	20.	A	21.	A	22.	C	23.	C	24.	B
25.	A	26.	A	27.	C	28.	C	29.	D	30.	B	31.	A	32.	D
33.	D	34.	B	35.	A	36.	D	37.	A	38.	B	39.	C	40.	B
41.	C	42.	D	43.	C	44	B	45.	C	46.	B	47.	B	48.	D
49.	B	50.	A	51.	B	52.	A	53.	C	54.	A	55.	B	56.	C
57.	A	58.	B	59.	C	60.	A	61.	B	62.	D	63.	B	64.	A
65.	C	66.	C	67.	C	68.	A	69.	B	70.	B	71.	D	72.	C
73.	A	74.	B	75.	C	76.	C	77.	A	78.	A	79.	D	80.	D
81.	D	82.	C	83.	A	84.	A	85.	D	86.	C	87.	D	88.	C
89.	B	90.	D	91.	A	92.	D	93.	C	94.	C	95.	B	96.	B
97.	B	98.	A	99.	B	100.	C								