## CLASS : XII

## MATHEMATICS

1. If $f(x)=\frac{2^{x}+2^{-x}}{2}$, then $f(x+y) \cdot f(x-y)=$ $\qquad$
(A) $\frac{1}{4}[f(2 x)+f(2 y)]$
(B) $\frac{1}{2}[f(2 \mathrm{x})+\mathrm{f}(2 \mathrm{y})]$
(C) $\frac{1}{2}[f(2 x)-f(2 y)]$
(D) $\frac{1}{4}[f(x)-f(2 y)]$
2. The domain of $f(x)=\cot ^{-1}\left(\frac{x}{\sqrt{x^{2}-\left[x^{2}\right]}}\right)$ is:
$\begin{array}{ll}\text { (A) } R & \text { (B) } R-\{0\} \\ \text { (C) } R-\{\sqrt{x}: x \in Z, x \geq 0\} & \text { (D) None ot, hese }\end{array}$
3. If $A$ and $B$ are two skew symmetric matrioes of order $n$, then :
(A) AB is a skew symmetrik matrix
(B) AB is a symmetril hatrix
(C) AB is a symmetric matrix if A and B commute
(D) None of these

4. If $f(x)=\cot ^{-1}\left(\frac{x^{x}-x^{-x}}{2}\right)$, then $f^{i}(1)=$ $\qquad$
(A) $-\log 2$
(B) $\log 2$
(C) 1
(D) -1
5. If there is a possible error of 0.02 cm in the measurement of the diameter of a sphere, then the possible percentage error in its volume when the radius 10 cm is :
(A) 0.1
(B) 0.2
(C) 0.3
(D) 0.4
6. $\int \frac{4 e^{*}+6 e^{-x}}{9 e^{*}-4 e^{-x}} d x=A x+B \log \left(9 e^{5 x}-4\right)+c$, then $A=$
(A) $\frac{-3}{2}$
(B) $\frac{3}{2}$
(C)
$\frac{-2}{3}$
(D) $\frac{2}{3}$
7. $\int_{2}^{3} \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}} d x=$ $\qquad$
(A) $\frac{1}{2}$
(B) $\frac{3}{2}$
(C) $\frac{5}{2}$
(D) 0
8. $d x+d y=(x+y)(d x-d y) \Rightarrow \log (x+y)=$ $\qquad$
(A) $x+y+c$
(B) $x+2 y+c$
(C) $x-y+c$
(D) $2 x+y+c$
9. The values of ' $c$ ' so that for all real $x$, the vectors $\operatorname{cxi}-6 \bar{j}+3 \bar{k}, x \bar{i}+2 \bar{j}+2 c x \bar{k}$ make an obtuse angle are:
(A) $\mathrm{c}<0$
(B) $0<c<\frac{4}{3}$
(C) $-\frac{4}{3}<c<0$
(D) $c>0$
10. The angle between the planes $2 x+6 y+6 z=9,3 x+4 y-5 z=9$ is :
(A) $\pi / 2$
(B) $2 \pi / 3$
(C) $3 \pi / 4$
(D) $5 \pi / 6$
11. Three groups of children contain 3 girls and one boy; 2 girls and 2 boys; one girl and 3 boys. One child is selected at random from each group. The probability that the three selected consist of 1 girl and 2 boys is:
(A) $\frac{13}{32}$
(B) $\frac{19}{32}$
(C) $\frac{13}{19}$
(D) $\frac{6}{19}$
12. If $\mathrm{f}:\{1,2,3, \ldots ..\} \rightarrow\{0, \pm 1, \pm 2, \ldots .$.$\} is defined by$

$$
f(n)=\left\{\begin{array}{l}
\frac{n}{2}, \text { if } n \text { is even } \\
-\left(\frac{n-1}{2}\right), \text { if } n \text { is odd }
\end{array}\right.
$$

then $\mathbf{f}^{-1}(-100)$ is:
(A) 100
(B) 199
(C) 201
(D) 200
14. If $\cos ^{-1}(x / 2)+\cos ^{-1}(y / 3)=\theta$, then $9 x^{2}-12 x y \cos \theta+4 y^{2}=$
(A) $36 \sin ^{2} \theta$
(B) $37 \sin ^{2} \theta$
(C) $39 \sin ^{2} \theta$
(D) None of these
15. If the product of the matrix $B=$

with a matrix A has inverse $C=\left[\begin{array}{ccc}-1 & 0 & 1 \\ 1 & 1 & 1 \\ 2 & 3 & 3 \\ 2 & 0 & 2\end{array}\right]$, then $A_{T^{-1}}=$ $\qquad$
(A) $\left.\left[\begin{array}{ccc}-3 & -5 & 5 \\ 0 & 9 & 14 \\ 2 & 2 & 6\end{array}\right] \right\rvert\,$
(B) $\left[\begin{array}{ccc}-3 & 5 & 5 \\ 0 & 0 & 9 \\ 2 & 14 & 16\end{array}\right]$
(C) $\left[\begin{array}{cc|c}-3 & -5 & -5 \\ 0 & 9 & 2 \\ 2 & 14 & 6\end{array}\right]$
(D) $\left[\begin{array}{ccc}-3 & -3 & -5 \\ 0 & 9 & 2 \\ 2 & 14 & 6\end{array}\right]$
19. The system of linear equations $x+y+z=2,2 x+y-z=3$, $\mathbf{3 x}+\mathbf{2 y}+k z=4$ has a unique solution if:
(A) $k \neq 0$
(B) $-1<\mathrm{k}<1$
(C) $-2<\mathrm{k}<2$
(D) $\mathrm{k}=0$
17. If $y=2^{a x}$ and $\frac{d y}{d x}=\log 256$ at $x=1$, then $a=$ $\qquad$
(A) 0
(B) 1
(C) 2
(D) 3
18. The portion of the tangent drawn at any point on $x^{2 / 3}+y^{2 / 3}=a^{2 / 3}(a>0)$, except the points on the coordinate axes, included between the coordinate axes is :
(A) $a$
(B) 2 a
(C) $a^{2 / 3}$
(D) $a^{2}$
19. $\operatorname{LLt}_{\mathrm{n} \rightarrow \infty}\left(\frac{1}{\mathrm{n}^{2}} \sec ^{2} \frac{1}{\mathrm{n}^{2}}+\frac{2}{\mathrm{n}^{2}} \sec ^{2} \frac{4}{\mathrm{n}^{2}}+\ldots+\frac{1}{\mathrm{n}^{2}} \sec ^{2} 1\right)=$ $\qquad$
(A) $\frac{1}{2} \sec 1$
(B) $\frac{1}{2} \operatorname{cosec} 1$
(C) $\tan 1$
(D) $\frac{1}{2} \tan 1$
20. The area included between the parabolas $y^{2}=4 a x, f^{2}=4 b y$ is :
(A) $\frac{16 a b}{3}$
(B) $\frac{16}{5} \mathrm{ab}$
(C) $\frac{5}{4}$
(D) None of these
21. The solution of the differential equation $\frac{d \hat{y}}{d x}-\frac{2 x y}{1+x^{2}}=0$ is:
(A) $\mathrm{y}=\mathrm{A}\left(1+\mathrm{x}^{2}\right)$
(B) $y=A \sqrt{1+x^{2}}$
(C) $y=\frac{A}{1+x^{2}}$
(D) $y=\frac{A}{\sqrt{1+x^{2}}}$
22. If $\bar{a}=(1,1,1), \bar{c}=(0,1,-1)$ are given vectors, then a vector $\bar{b}$ satisfying the equations $\bar{a} \times \bar{b}=\bar{c}$ and $\bar{a} \cdot \bar{b}=3$ is:
(A) $5 \overline{\mathrm{i}}+2 \hat{j}+2 \overline{\mathrm{~K}}$
(B) $\frac{5}{2} \overline{\mathrm{i}}+\overline{\mathrm{j}}+\overline{\mathrm{k}}$
(C) $\frac{5}{3} \bar{i}+\frac{2}{3} \bar{j}+\frac{2}{3} \bar{k}$
(D) $\overline{\mathrm{i}}+\frac{2}{5} \overline{\mathrm{j}}+\frac{2}{5} \overline{\mathrm{k}}$
23. If $O A$ is equally inclined to $O X, O Y$ and $O Z$ and if $A$ is $\sqrt{3}$ units from the origin, then $A$ is:
(A) $(3,3,3)$
(B) $(-1,1,-1)$
(C) $(-1,1,1)$
(D) $(1,1,1)$
24. If the mean and the variance of a binomial variate $X$ are 2 and 1 respectively, then the probability that $X$ takes a value greater than one is equal to :
(A) $\frac{1}{16}$
(B) $\frac{5}{16}$
(C) $\frac{11}{16}$
(D) $\frac{15}{16}$
25. If $f(x)=(x+1)^{2}-1, x \geq-1$, then the set $S=\left\{x: f(x)=f^{1} / x\right\}$ is:
(A) $\left\{0,-1, \frac{-3+i \sqrt{3}}{2}, \frac{-3-i \sqrt{3}}{2}\right\}$
(C) $\{0,-1\}$
26. The sum of the infinite series $\sin ^{-1} \frac{1}{\sqrt{2}}+\sin ^{-1}\left(\frac{\sqrt{2}-1}{\sqrt{6}}\right)+\sin ^{-1}\left(\frac{\sqrt{3}-\sqrt{2}}{\sqrt{12}}\right)+\ldots+$ $\sin ^{-1}\left(\frac{\sqrt{n}-\sqrt{n-1}}{\sqrt{n(n+1)}}\right)$ is:
(A) $\frac{\pi}{4}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{2}$
(D) $\pi$
27. Let $A=\left(\begin{array}{ll}1 & 2 \\ 3 & 4\end{array}\right)$ and $B=\left(\begin{array}{ll}a & 0 \\ 0 & b\end{array}\right), a, b \in N$. Then $\qquad$
(A) ${ }^{-}$there exists exactly one $B$ such that $A B=B A$
(B) there exist infinitely many B 's such that $\mathrm{AB}=\mathrm{BA}$
(C) there yannot exist any B such that $\mathrm{AB}=\mathrm{BA}$
(D) there exist more than one but finite number of $B$ 's such that $A B=B A$
28. If $a$, $b$, c are the ranks of $\left[\begin{array}{lll}0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0\end{array}\right],\left[\begin{array}{ccc}1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1\end{array}\right],\left[\begin{array}{ccc}1 & 2 & 3 \\ 2 & 4 & 7 \\ 3 & 6 & 10\end{array}\right]$
respectively, then the ascending order of $a, b, c$ is:
(A) a,b, c
(B) $b, c, a$
(C) $\mathrm{c}, \mathrm{a}, \mathrm{b}$
(D) $a, c, b$
29. If $x=\sec \theta-\cos \theta, y=\sec ^{n} \theta-\cos ^{n} \theta$, then $\left(\frac{d y}{d x}\right)^{2}=$ $\qquad$
(A) $\frac{y^{2}+4}{x^{2}+4}$
(B) $\frac{\mathrm{n}^{2}\left(\mathrm{y}^{2}+4\right)}{\left(\mathrm{x}^{2}+4\right)}$
(C) $\frac{x^{2}+4}{y^{2}+4}$
(D) $\frac{\mathrm{n}^{2}\left(\mathrm{x}^{2}+4\right)}{\mathrm{y}^{2}+4}$
30. The minimum value of $27^{\cos 2 x} \cdot 81^{\sin 2 x}$ is :
(A) $\frac{1}{243}$
(B) -5
(C) $\frac{1}{5}$
(D) None of theses
31. If $f(x)=(1+\tan x)[1+\tan (\pi / 4-x)]$ and $g(x)$ is affunction with domain $R$, then $\int_{0}^{1} x^{3} \operatorname{gof}(x) d x$ is
(A) $\frac{1}{2} g(\pi / 4)$
(B) $\frac{1}{4} g(2)$
(C) $\frac{1}{4} \mathrm{~g}(1)$
(D) None of these
32. A: The area of the region bounded $b y y^{2}=4 x, y=x$ is $8 / 3$. $R$ : The area of the region bounded by $y^{2}=4 a x, y=m x$ is $8 a^{2} / 3 m^{3}$.
(A) Both $A$ and $R$ are true and $R$ is the correct explanation of $A$
(B) Both $A$ and $B$ are true but $R$ is not correct explanation of $A$
(C) A is true but R is false
(D) A is false but $R$ is true
33. The solution of $\frac{d y}{d x}+\frac{y^{2}+y+1}{x^{2}+x+1}=0$ is :
(A) $\tan ^{-1}(2 \mathrm{x}+1)+\tan ^{-1}(2 \mathrm{y}+1)=\mathrm{c}$
(B) $\tan ^{-1} \frac{2 x+1}{\sqrt{3}}+\tan ^{-1} \frac{2 y+1}{\sqrt{3}}=c$
(C) $\tan ^{-1} \frac{2 x}{\sqrt{3}}+\tan ^{-1} \frac{2 y}{\sqrt{3}}=c$
(D) $\tan ^{-1} \frac{2 x-1}{\sqrt{3}}+\tan ^{-1} \frac{2 y-1}{\sqrt{3}}=c$
34. If the points $(3,2,-4),(5,4, k),(9,8,-10)$ are collinear, then $k=$ $\qquad$
(A) 6
(B) 3
(C) -6
(D) -3
35. If $\bar{a}, \bar{b}, \bar{c}$ are non-coplanar unit vectors such that $\overline{\mathrm{a}} \times(\overline{\mathrm{b}} \times \overline{\mathrm{c}})=\frac{\overline{\mathrm{b}}+\overline{\mathrm{c}}}{\sqrt{2}}$, then the angle between $\overline{\mathrm{a}}$ and $\overline{\mathrm{b}}$ is;
(A) $3 \pi / 4$
(B) $\pi / 4$
(C) $\pi / 2$
(D) $\pi$
36. Observe the following statements.

A: Three vectors are coplanar if one of them is exppessible as a linear combination of the other two.
R : Any three coplanar vectors are linearly dependent. Then which of the following is true?
(A) Both $A$ and $R$ are true and $R$ is the correct explanation of $A$
(B) Both A and R are true but R is not the correct explanation of A
(C) $A$ is true, but $R$ is false
(D) $A$ is false, but $R$ is true
37. Let $f(x)=\left\{\begin{array}{l}|x| \cos \frac{1}{x}+1 \hat{p} x \in x \neq 0 \\ k, x=0\end{array}\right.$, then $f(x)$ is continuous at
(A) 15
(B) -15
(C) 0
(D) 6
38. The ratio in which the plane $2 \mathrm{x}+3 \mathrm{y}-2 \mathrm{z}+7=0$ divides the line segment joining the points $(-1,2,3),(2,3,5)$ is :
(A) $3^{\circ}: 5$
(B) $7: 5$
(C) $9: 11$
(D) $1: 2$ externally
39. $\int_{-1}^{1}\left(x^{27} \cos x+e^{x}\right) d x=$ $\qquad$
(A) $2 e-\frac{1}{e}$
(B) $e+\frac{1}{e}$
(C) $e-\frac{1}{e}$
(D) $\frac{1}{e}$
40. The order of the differential equation $\left(\frac{d y}{d x}+3 x\right)^{3 / 2}=x+3$ $\frac{d y}{d x}$ is :
(A) 1
(B) 2
(C) 3
(D) 4

## CLASS : XII

## PHYSICS

41. When we view objects lying at different distances from the eye, which of the following remain constant?
(A) The focal length of the eye lens.
(B) The radii of curvature of the eye lens.
(C) The image distance from the eye lens.
(D) The object distance from the eye lens.
42. A neutron, a proton, an electron and an alphap particle enter a region of constant magnetic field with equal velocities. The magnetic field is along the inward normal to the plane of the paper. The tyacks of each particle are shown in the figure. Which of the following tracks represent the track followed by an electron and an alpha particle respectively?

(A) AB
(B) BC
(C) AD
(D) AC
43. In the figure the symbol of semiconductor device is shown.


Identify the device and infer what does the arrow head in the symbol indicate?
(A) NPN transistor, direction of hole flow in the emitter region.
(B) PNP transistor, direction of electron flow in the emitter region.
(C) NPN transistor, direction of electron flow in the emitter region.
(D) PNP transistor, direction of majority carrier in the emitter region.
44. Under what condition does a lens immersed in a transparent liquid becomes invisible?
(A) The refractive index of the material of the lens is greater than the refractive index of the liquid.
(B) The refractive index of the material of the lens is less than the refractive index of the liquid.
(C) The refractive index of the material of the lens is equal to than the refractive index of the liquid.
(D) The refractive index of the material is greater than or equal to the refractive index of the liquid.
45. Rohan was conducting Young's double slit experiment in the laboratory. He uses white light instead of monochromatic light what were the observations made by him?
(A) There were no fringe observed.
(B) Only the central fringe is white, all other fringes are coloured.
(C) All bright fringes became white coloured.
(D) All bright fringes have colours between violet and red.
46. A piece of copper and another silicon are cooled from room temperafure to 80 K . What happens to the value of resistance of each piece?

47. What is the electric flux obtained through a surface $\overrightarrow{\mathrm{S}}=6 \hat{\mathbf{k}}$ kept in an electric field $\overrightarrow{\mathbf{E}}=3 \hat{\mathbf{i}}+6 \hat{\mathbf{j}}+7 \hat{\mathbf{k}}$ ?
(A) 18 units
(B) 36 units
(C) 54 units
(D) 42 units
48. What is it required to be connected for converting a galvanometer into an ammeter?
(A) A low resistance in series to the galvanometer.
(B) A high resistance in series to the galvanometer.
(C) A low resistance in parallel to the galvanometer.
(D) A high resistance in parallel to the galvanometer.
49. Four coils $\mathrm{L}_{1}, \mathrm{~L}_{2}, \mathrm{~L}_{9}, \mathrm{~L}_{4}$ have namber of turns as 25,100 , 60,10 respectively. If same current flows through these coils producing same flux through them then what is the ascending order of their self inductances?
(A) $\mathrm{L}_{4}, \mathrm{~L}_{1}, \mathrm{~L}_{3}, \mathrm{~L}_{2}$
(B) $L_{2}, L_{3}, L_{1}, L_{4}$
(C) $\mathrm{L}_{1}, \mathrm{~L}_{2}, \mathrm{~L}_{3}, \mathrm{~L}_{4}$
(D) $\mathrm{L}_{3}, \mathrm{~L}_{2}, \mathrm{I}_{4}, \mathrm{~L}_{1}$
50. Two parallel plates $A$ and $B$ of charge densities $+\sigma$ and - $\sigma$ respectively are shown, in the figare. Identify the regions of zero electric intensity.

(A) Only I and If
(B) Only II and III
(C) Only I and III
(D) I, II and III
51. Assertion: Work function of caesium is greater than that of sodium. Byt both will have same value of threshold frequency and threshold wavelength.

Reason: Unless $h v_{0}=$ work function of metals, no photo emission of electrons is possible.
(A) Both assertion and reason are true and reason is the correct explanation of the assertion.
(B) Both assertion and reason are true, but reason is not the correct explanation of the assertion.
(C) Assertion is true, but reason is false.
(D) Assertion is false, but reason is true.
52. In a semiconductor diode, barrier potential offers opposition to which of the following given below?
(A) Majority carriers in P - region only.
(B) Majority carriers in both regions.
(C) Minority carriers in both regions.
(D) Majority as well as minority carriers in both regions.
53. Observe the following digital circuit constructed using two NAND gates followed by a NOR gate:


Which single gate given below does the equivalent circuit with inpots $\mathrm{A}, \mathrm{B}, \mathrm{C}$ and output X berpplaced by?
(A)

(B)

(C)

(D)

54. A monochromatic light falls at an angle of incidence ' i ' on a slab of a transparent material. If the refractive index of this slab is $\mu$ for this incident light ray, then for what angle of incidence the reflected and the refracted rays are mutually perpendicular?
(A) $i=\sin ^{-1}(\mu)$
(B) $i=\cos ^{-1}(\mu)$
(C) $\mathrm{i}=\tan ^{-1}(\mu)$
(D) $\mathrm{i}=\cot ^{-1}(\mu)$
55. What happens to the binding energy per nucleon, when the number of nucleons in nucleus increases?
(A) Increases continuously with mass number.
(B) Decreases continuously with mass number.
(C) Remains constant with mass number.
(D) First increases and then decreases with increase of mass number.
56. Observe the network given below:


Find the effective resistance across points $X$ and $Y$.
(A) $\frac{8}{3} \Omega$
(B) $10 \Omega$
(C) $30 \Omega$
(D) $48 \Omega$
57. A vertical wire carrying a carrent in the upward direction is placed in a horizontal magnetic field directed south. In what direction will the wire experience a force?
(A) North
(B) East
(C) South
(D) West
58. Which of the following have least specific charge ratio?
(A) $\alpha$ particle
(B) Prator
(C) Positron
(D) Positive Meson
59. Assertion: Work done in moving a positive charge on an equipotential surface is zero.
Reason: The surface which is the locus of all points which are at the same potential is known as equipotential surface.
(A) Both assertion and reason are true and reason is the correct explanetion of the assertion.
(B) Both assertion and reason are true, but reason is not the correct explanation of the assertion.
(C) Assertion is true, but reason is false.
(D) Assertion is false, but reason is true.
60. What is the dimensional formula of capacitor?
(A) $\mathrm{M} \mathrm{L}^{-2} \mathrm{~T}^{-4} \mathrm{~A}^{2}$
(B) $\mathrm{M}^{-1} \mathrm{~L}^{2} \mathrm{~T}^{4} \mathrm{~A}^{2}$
(C) $\mathrm{M}^{-1} \mathrm{~L}^{-2} \mathrm{~T}^{4} \mathrm{~A}^{2}$
(D) $\mathrm{M}^{0} \mathrm{~L}^{-1} \mathrm{~T}^{-1} \mathrm{~A}^{2}$
61. The displacement of the interfering light waves are $y_{1}=4 \sin \omega t$ and $y_{2}=3 \sin (\omega t+\pi / 2)$. What is the amplitude of resultant wave?
(A) 7
(B) 5
(C) 1
(D) 0
62. Sanjay connected 3 identical bulbs in parallel and these together dissipate a power $p$. If these bulbs are now connected in series, then what will be the power
dissipated?
(A) $3 p$
(B) $9 p$
(C) $\mathrm{p} / 9$
(D) $0 / 3$
63. At which of the following conditions resonance takes place in all $L-C-R$ series cifcuit?

1. Impedance is minimum
il. Resonant frequency does not depend of R
III. Current is maximum
IV. Phase difference between current and foltage is $\frac{\pi}{2}$
(A) I, II and III only
(B) I, III and IV only
(C) I, II and IY only
(D) II, III and IV only
2. What is the hature of sun's spectrum?
(A) Bäd absorption spectrum
(B) Line emission spectrum
(C) Continuous band spectrum
(D) Continuous spectrum with a few absorption lines
3. A potential difference of 2 V is applied to a coil of resistance $2 \Omega$ and inductance 2 H . What is the current after 1 second?
(A) 0.732 A
(B) 0.632 A
(C) 0.932 A
(D) 0.693 A

## CLASS : XII

## CHEMISTRY

66. Identify the correct structure of the drug paracetamol.
(A)

(B)

(C)

(D)

67. Which of the following set of bases are present both in DNA and RNA?
(A) Adenine, guanine, uracil
(B) Adenine, uracil, thymine
(C) Adenine, guanine, thymine
(D) Adenine, guanine, cytosine
68. By what kind of bond does linear chains in nylon are held together?
(A) H - bonds
(B) Ionic bonds
(C) Covalent bonds
(D) Vandet yaal's forces
69. In aqueous solutions, how do most of amino acids exist as?
(A) $\mathrm{NH}_{2}-\mathrm{CHR}-\mathrm{COOH}$
(B) $\mathrm{NH}_{2}-\mathrm{CHR}-\mathrm{COO}^{-}$
(C) $\mathrm{H}_{3} \mathrm{~N}^{+}-\mathrm{CHR}-\mathrm{COO}$
(D) $\mathrm{H}_{3} \mathrm{~N}^{+}-\mathrm{CHR}-\mathrm{COOH}$
70. Which of the following pairs give positive Tollen's test?
(A) Glucose, Sucrose
(B) Hexanal, Acetophenone
(C) Fructose, Suatose
(D) Hexanal, Glucose
71. What are needed for carbylamine reaction?
I. Hot aloholleKOH
II. Chloroformandsilver powder
III. Any prlmary amineandchlor of orm
(A) I and IIf only (B) I and III only (C) II and IU only
(D) I, II and III
72. Why are zetones less reactive than aldehydes?


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

## CLASS : Xil (PCM)

## Unified Council

73. Phenol can be obtained by the action of NaOH on chloro benzene. Identify the best conditions for the reaction.
(A) $15 \% \mathrm{NaOH}$ solution at $600^{\circ} \mathrm{C}$.
(B) Concentrated solution of NaOH at low temperature
(C) Solid sodium hydroxide at low temperature.
(D) $6-8 \% \mathrm{NaOH}$ solution at $350^{\circ} \mathrm{C}$ and under pressure.
74. What is the product obtained on treating ethyl chloride with dry $\mathrm{Ag}_{2} \mathbf{O}$ ?
(A) Diethyl ether
(B) Ethy alcohol
(C) Ethene
(D) Ethane
75. An alkyl halide by formation of its Grignard (reágent and heating with water yields propane. What is the original
alkyl halide?
(A) Methyl iodide
(B) Ethyl iodide
(C) Propyl bromide
(D) Ethyl bropide
76. Observe the given combination of regetants:

$\mathrm{NaOCH}_{3}$ in methanol

Select by which of the following mechanisms, the above combination of reactants will react?
(A) $\mathrm{SN}^{2}$
(B) $E_{1}$
(C) $\mathrm{SN}^{1}$
(D) $\mathrm{E}_{2}$
77.

## $\mathrm{NHCH}_{2} \mathrm{CH}_{3}$

$-\mathrm{CH}_{3} \mathrm{I}$ (excess) $\rightarrow$ product. Identify the product.
(A) A pri 1 ary amine
(B) A quaternary ammonium salt
(C) A segondary amine
(D) A tertiary amine
78. What type of hybridisation is involved in the formation of $\left[\mathrm{Co}_{6}{ }^{13-}\right.$ ?
(A) $\mathrm{d}^{2} \mathrm{sp}{ }^{3}$
(B) $\mathrm{d}^{3} \mathrm{sp}^{2}$
(C) $\mathrm{sp}^{3} \mathrm{~d}^{2}$
(D) $\mathrm{sp}^{2}$
79. Identify the coordination number from the following which exhibits geometrical isomerism in coordination compounds?
(A) 2
(B) 3
(C) 4
(D) 6
80. Why is the highest oxidation state given by a transition element?
(A) Outer most $s$ electrons
(B) Outer most d electrons
(C) Outer most $s$ and d electrons
(D) The group number
81. Assertion: $\mathrm{PCl}_{\delta}$ exists whereas $\mathrm{NCl}_{5}$ does not exist. Reason: $\mathbf{N C l}_{5}$ is highly unstable.
(A) Both assertion and reason are true and reason is the correct explanation of the assertion.
(B) Both assertion and reason are true, but reason is not the correct explanation of the assertion.
(C) Assertion is true, but reason is false.
(D) Assertion is false, but reason is
82. Identify the decreasing order of reducing power of hydrogen halides.
(A) $\mathrm{HF}>\mathrm{HCl}>\mathrm{HBr}>\mathrm{HI}$
(B) $\mathrm{HI}>\mathrm{HBr}>\mathrm{HCl}>\mathrm{HF}$
(C) $\mathrm{HI}>\mathrm{HF}>\mathrm{HBr}>\mathrm{HCl}$
(D) $\mathrm{HCl}>\mathrm{H} P>\mathrm{HI}>\mathrm{HBr}$
83. Assertion: During the electrolysis of alumina, cryolite is added.
Reason: Addition of crgolite lowers the melting point and increase the electriegl conductivity of alumina.
(A) Both assertion and reason are true and reason is the correct explanation of the assertion.
(B) Both assertion, and reason are true, but reason is not the correct explanation of the assertion.
(C) Assertion is true, but reason is false.
(D) Assertion is false, but reason is true.
84. Why does, the sea appear blue in colour?
(A) Refraction of the blue light by the impurities in sea water.
(B) Scattermg of blue light by sol particles.
(C) Reflection of blue light by sea water.
(D) Absorption of other colours except blue colour.
85. The rate law for a reaction between $A$ and $B$ is given by tate $=K[A]^{n}[B]^{\text {r. }}$. On doubling the concentration of $A$ and halving the concentration of $B$, what will be the ratio of new rate of the earlier rate of the reaction?
(A) $2^{m-n}$
(B) $n-m$
(C) $2^{\mathrm{m}+\mathrm{n}}$
(D) $2^{\mathrm{n}-m}$
86. A reactant ( A ) forms two products:
$A \xrightarrow{R_{1}} B$; Activation energy $E_{a_{1}}$
$A \xrightarrow{\mathbf{E}_{2}} C$; Activation energy $\mathrm{E}_{\mathrm{a}_{2}}$
If $E a_{1}=2 E a_{2}$, then find the relation between $K_{1}$ and $K_{2}$.
(A) $\mathrm{K}_{1}=\mathrm{K}_{2} e^{-E a_{1} / R T}$
(B) $\mathrm{K}_{2}=\mathrm{K}_{1} \mathrm{e}^{-\mathrm{Ea}_{1} / R T}$
(C) $\mathrm{K}_{2}=\mathrm{K}_{1} \mathrm{e}^{\mathrm{Ea}_{2} / \mathrm{RT}}$
(D) $\mathrm{K}_{1}=\mathrm{K}_{2} \mathrm{e}^{\mathrm{Ea}_{2} / \mathrm{RT}}$
87. Whet happens when zinc metal is added to an aquequs solution containing magnesium nitrate and sflver nitrate?

(A) I and II only
(B) I and 1 IT only
(C) II and III only
(D) I, II andIII
88. Consider a voltaic cellbased on the given half cells:
$\mathrm{Al}^{+3}$ (aq.) $+3 \mathrm{e}^{-} \rightarrow \mathrm{Al}(\mathrm{S}) ; \mathrm{E}^{0}=-1.66 \mathrm{~V}$
$\mathrm{Cu}^{+2}$ (aq.) $+2 \mathrm{e}^{-} \rightarrow \mathbf{C u}(\mathrm{S}) ; \mathbf{E}^{0}=+0.34 \mathrm{~V}$
Identify the anode and give the voltage of this cell under standard conditions.
(A) $\mathrm{Cu}_{3}, \mathrm{E}_{\text {cell }}=2(30 \mathrm{~V}$
(B) Al; $\mathrm{E}_{\text {cell }}=2.00 \mathrm{~V}$
(C) $\mathrm{Al}, \mathrm{E}_{\text {cell }}=+1.32 \mathrm{~V}$
(D) $\mathrm{Cu} ; \mathrm{E}_{\text {cell }}=4.34 \mathrm{~V}$
89. Why is camphor often used in molecular mass deteradination?
(A) It is readily available.
(B) It is highly volatile.
(C) It is hygroscopic.
(D) It has a very high cryoscopic constant.
90. Where are $\mathrm{Ca}^{+2}$ and $\mathbf{F}^{-}$ions located in $\mathrm{CaF}_{2}$ crystal?

$$
\mathrm{Ca}^{+\mathbb{2}} \text { ions }
$$

(A) At FCC lattice points
(B) At BCC lattice points
(C) At simple cubic lattice
(D) At BCC lattice points
$\mathrm{F}^{-}$ions
Tetrahedral voids
Octahedral voids
Octahedral voids
Tetrahedral voids

## CLASS : XII

## GENERAL KNOWLEDGE

91. Choose the alternative which has figure ( $\mathbf{X}$ ) embedded in it.

(A)

(B)

(C)

(D)

92. Find the missing number in the following figure.

(A) 38
(B) 66
(C) 68
(D) 70
93. What was the code-name of the India's first atomic device exploded at Pokhran?
(A) Smiling Mahavira
(B) Smiling Buddha
(C) Little Boy
(D) Enlightened Buddha
94. Europe, Asia, Afriea, Australia and America are the five geographic areas symbolized by the circles on the:
(A) U.N. flag
(B) General Assembly flag
(C) Olympic flag
(D) Commonwealth Games
95. Where in Delhi would you find this Persian inscription: 'If there be a paradise on earth, it is here, it is here'?
(A) Red Fort
(B) Jama Masjid
(C) Qutub Minar
(D) Hawa Mahal
96. In 2009, Barack Obama won Nobel Prize for:
(A) Literature
(B) Economics
(C) Peace
(D) Medicine
97. How many countries are in G-20?
(A) 20
(B) 23
(C) 26
(D) 28
98. Bibliology is the study of:
(A) books
(B) fruits
(C) gravitation (D) food
99. Yasin Merchant is an expert in:
(A) cricket
(B) snooker
(C) chess
(D) archery
100. What was the name of Polar Satellite Launch Vehicle which put Chandrayan I into orbit?
(A) PSLV-C II
(B) SLV
(C) SLV-3
(D) PSLV-D

## KEY FOR THE Q.P.-2010

1. B 2. C 3. C 4. A 5. D
2. C 10. C 11. A
3. C
4. A
5. C
6. C
7. D 43. A
8. C
9. A
10. B 67. D
11. A 75. C
12. B 83. A
13. A 91. B
14. A 99. B
15. B 85. D 92. D 93. B
16. C
17. A
18. B
19. C
20. B
21. A
22. B
23. C
24. B
25. C 7. A 8. A
26. A 15. C 16. A
27. C
28. A
29. D
30. C
31. C
32. C
33. D
34. C
35. C
36. C
37. D
38. B
39. C
40. D
41. D
42. A
43. B
44. D
45. A
46. A
47. C 32. A 40. A 48. C 56. B 64. D 72. B 80. C 100.A
