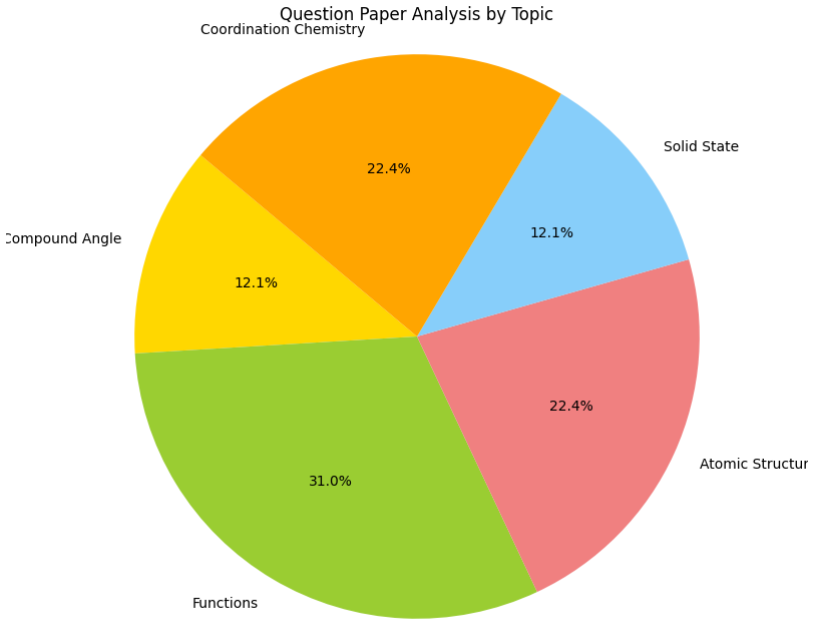
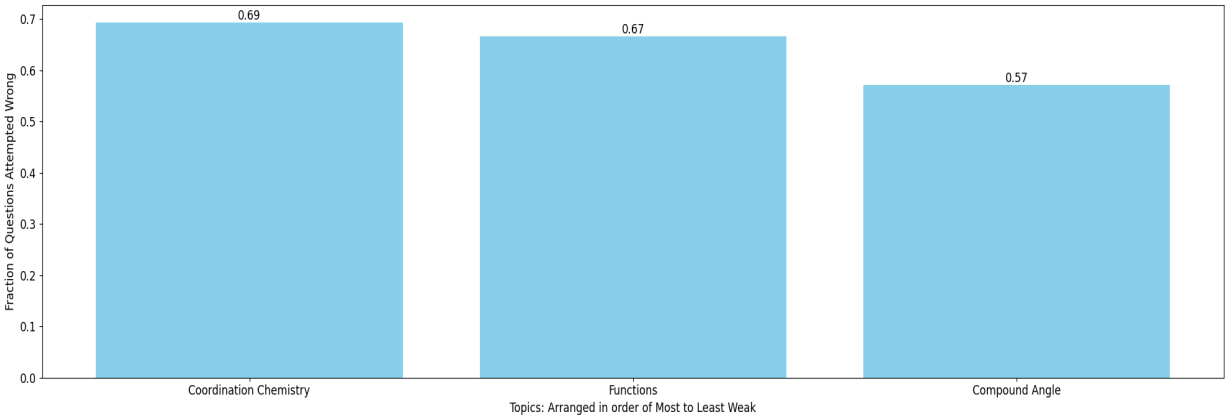
NIKHIL REDHU Total
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Coordination Chemistry:

30. Consider the following complex ions P, Q and R ,

$P = [FeF_6]^{3-}$, $Q = [V(H_2O)_6]^{2+}$ and $R = [Fe(H_2O)_6]^{2+}$

The correct order of the complex ions, according to their spin-only magnetic moment values (in B.M.) is - **[JEE 2013]**

(A) R < Q < P (B) Q < R < P (C) R < P < Q (D) Q < P < R

42. Which one of the following complexes will most likely absorb visible light ?

[J-MAIN–2014, Online]

(At nos. Sc = 21, Ti = 22, V = 23, Zn = 30) :-

(1) $[Ti(NH_3)_6]^{4+}$ (2) $[V(NH_3)_6]^{3+}$ (3) $[Zn(NH_3)_6]^{2+}$ (4) $[Sc(H_2O)_6]^{3+}$

26. Consider the following statements:

According the Werner's theory.

(a) Ligands are connected to the metal ions by covalent bonds.

(b) Secondary valencies have directional properties

(c) Secondary valencies are non-ionisable

Of these statements:

(A) a, b and c are correct (B) b and c are correct

(C) a and c are correct (D) a and b are correct

50. The two compounds $[Co(SO_4)(NH_3)_5]Br$ and $[Co(SO_4)(NH_3)_5]Cl$ represent:

(A) Linkage isomerism (B) Ionisation isomerism

(C) Co-ordination isomerism (D) No isomerism

48. The correct option(s) regarding the complex $[Co(en)(NH_3)_3(H_2O)]^{3+}$ ($en = H_2NCH_2CH_2NH_2$) is (are) **[JEE ADV. 2018]**

(A) It has two geometrical isomers

(B) It will have three geometrical isomers if bidentate 'en' is replaced by two cyanide ligands

(C) It is paramagnetic

(D) It absorbs light at longer wavelength as compared to $[Co(en)(NH_3)_4]^{3+}$

Functions:

1. Let

$$F(x) = \begin{cases} x|x| & \text{if} \quad x \leq -1 \\ [1+x] + [1-x] & \text{if} \quad -1 < x < 1 \\ -x|x| & \text{if} \quad x \geq 1 \end{cases}$$

where $[x]$ denotes the greatest integer function then $F(x)$ is

(A) even (B) odd

(C) neither odd nor even (D) even as well as odd

2. Which of the following equations have the same graphs?

I. $y = x - 2$

II. $y = \frac{(x^2-4)}{(x+2)}$

III. $(x + 2)y = x^2 - 4$

(A) I and II only.

(B) I and III only.

(C) II and III only.

(D) All the equations have different graphs.

14. If $f(x) = \left(\frac{1-x}{1+x}\right)$, $|x| < 1$, then $f\left(\frac{2x}{1+x^2}\right)$ is equal to **[JEE - Main 2019]**

(A) $2f(x)$ (B) $2f(x^2)$ (C) $(f(x))^2$ (D) $-2f(x)$

20. Let N be the set of natural numbers and two functions f and g be defined as f, g: N $\longrightarrow$ N such that $f(n) = \begin{cases} \frac{n+1}{2}; & \text{if n is odd} \\ \frac{n}{2}; & \text{if n is even} \end{cases}$ and $g(n) = n - (-1)^n$. Then, fog is **[JEE - Main 2019]**

(A) one-one but not onto (B) onto but not one-one

(C) both one-one and onto (D) neither one-one nor onto

7. Let f be a function defined as f: $\left(0, e^{\frac{\pi}{2}}\right] \rightarrow \left[\frac{-1}{4}, \infty\right)$, $f(x) = (\ln x)^2 + 3\ln x + 2$ then $f^{-1}(x)$ equals

(A) $\log\left(\frac{-3+\sqrt{4x+1}}{2}\right)$ (B) $\log\left(\frac{-3-\sqrt{4x+1}}{2}\right)$

(C) $e^{\frac{-3+\sqrt{4x+1}}{2}}$ (D) $e^{\frac{-3-\sqrt{4x+1}}{2}}$

Compound Angle:

2. A person standing on the bank of a river observes that the angle of elevation of the top a tree on the opposite bank of the river is 60° and when he retires 40 meters away from the tree the angle of elevation becomes 30°. The breadth of the river is **[AIEEE 2004]**

(A) 60 m (B) 30 m (C) 40 m (D) 20 m

1. Prove that $\frac{\sin(A+B+C)}{\cos A \cos B \cos C} = \tan A + \tan B + \tan C - \tan A \tan B \tan C$

1. If $m\tan(\theta - 30^\circ) = n\tan(\theta + 120^\circ)$, show that $\cos 2\theta = \frac{m+n}{2(m-n)}$.

7. Let a, b, c, d be real number such that $a^2 + b^2 = 9, c^2 + d^2 = 4$ and $ad - bc = 6$. Find the maximum value of ac.

7. Let $f(\theta) = 2\cos\theta - \cos^2\theta, \forall\theta \in R$ then which one of the following relation is true ?

(A) $-2 \leq f(\theta) \leq 1$ (B) $\frac{1}{4} \leq f(\theta) \leq 1$

(C) $-3 \leq f(\theta) \leq 1$ (D) $-3 \leq f(\theta) \leq 0$