

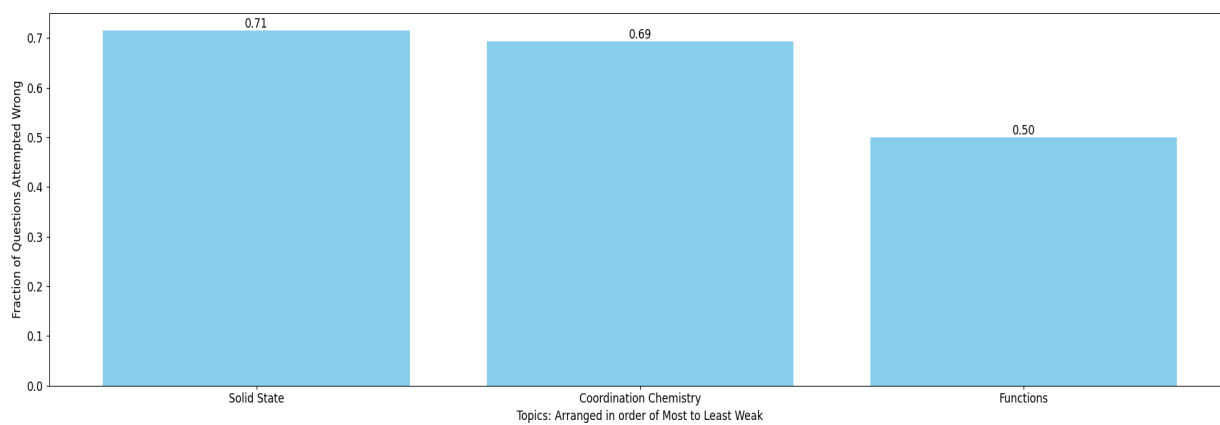
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MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Solid State:

6. Which of the following statement is not true about amorphous solids?
(A) On heating they may become crystalline at certain temperature.
(B) They may become crystalline on keeping for long time.
(C) Amorphous solids can be moulded by heating.
(D) They are anisotropic in nature.
11. A cubic unit cell contains manganese ions at the corners and fluoride ions at the center of each edge.
(a) What is the empirical formula of the compound?
(b) What is the co-ordination number of the Mn ion?
(c) Calculate the edge length of the unit cell, if the radius of Mn ion is 0.65 \AA and that of F^- ion is 0.45 \AA .
17. The empty space in this HCP unit cell is **[JEE 2008]**
(A) 74% (B) 47.6 % (C) 32% (D) 26%
50. Graphite cannot be classified as _____.
(A) conducting solid (B) network solid
(C) covalent solid (D) ionic solid
8. Which of the following statements is/are correct?
(A) In an anti-fluorite structure anions form FCC lattice and cations occupy all tetrahedral voids.
(B) Number of nearest Na^+ ions of another Na^+ in Na_2O crystal will be 8.
(C) Each sphere is surrounded by six voids in two dimensional hexagonal close packed layers
(D) 8 Cs^+ ions occupy the second nearest neighbour locations of a Cs^+ ion
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Coordination Chemistry:

58. The complex that has highest crystal field splitting energy (Δ) is : [JEE MAIN 2019]
 (1) $K_2[CoCl_4]$ (2) $[Co(NH_3)_5Cl]Cl_2$
 (3) $[Co(NH_3)_5(H_2O)]Cl_3$ (4) $K_3[Co(CN)_6]$
53. Consider the following reaction and statements : [JEE MAIN 2018]
 $[Co(NH_3)_4Br_2]^+ + Br^- \rightarrow [Co(NH_3)_3Br_3] + NH_3$
 (I) Two isomers are produced if the reactant complex ion is a cis-isomer
 (II) Two isomers are produced if the reactant complex ion is a trans-isomer
 (III) Only one isomer is produced if the reactant complex ion is a trans-isomer.
 (IV) Only one isomer is produced if the reactant complex ion is a cis-isomer.
 (1) (II) and (IV) (2) (I) and (II) (3) (I) and (III) (4) (III) and (IV)
7. **Statement-1:** Cis-isomer of $[Co(en)_2Cl_2]Cl$ shows optical activity.
Statement-2: Cis-isomer of $[Co(en)_2Cl_2]Cl$ is a symmetric molecule.
 (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
 (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
 (C) Statement-1 is true, statement-2 is false.
 (D) Statement-1 is false, statement-2 is true.
73. Among the statements (a)-(d), the incorrect ones are: [JEE MAIN 2020]
 (a) Octahedral Co(III) complexes with strong field ligands have very high magnetic moments
 (b) When $\Delta_0 < P$, the d-electron configuration of Co(III) in an octahedral complex is $t_{2g}^4 e_g^2$
 (c) Wavelength of light absorbed by $[Co(en)_3]^{3+}$ is lower than that of $[CoF_6]^{3-}$
 (d) If the Δ_0 for an octahedral complex of Co(III) is $18,000\text{ cm}^{-1}$, the Δ_t for its tetrahedral complex with the same ligand will be $16,000\text{ cm}^{-1}$
 (1) (a) and (d) only (2) (a) and (b) only (3) (c) and (d) only (4) (b) and (c) only
93. The d-electronic configuration of $[CoCl_4]^{2-}$ in tetrahedral crystal field is $e^m t_2^n$. Sum of "m" and "number of unpaired electrons" is [JEE MAIN 2023]
- Ans. (7)

Functions:

22. If $g(x) = x^2 + x - 1$ and $(g \circ f)(x) = 4x^2 - 10x + 5$, then $f\left(\frac{3}{4}\right)$ is equal to: **[JEE - Main 2020]**

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

2. Find the domain & range of the following functions. (Read the symbols $[*]$ and $\{*\}$ as greatest integers and fractional part functions respectively.)

(i) $y = \log_{\sqrt{5}} (\sqrt{2}(\sin x - \cos x) + 3)$

(ii) $y = \frac{2x}{1+x^2}$

(iii) $f(x) = \frac{x^2 - 3x + 2}{x^2 + x - 6}$

(iv) $f(x) = \frac{x}{1+|x|}$

(v) $y = \sqrt{2-x} + \sqrt{1+x}$

(vi) $f(x) = \frac{\sqrt{x+4}-3}{x-5}$

8. Let $f(x) = x^2 + \frac{1}{x^2}$ and $g(x) = x - \frac{1}{x}, x \in \mathbb{R} - \{-1, 0, 1\}$.

If $h(x) = \frac{f(x)}{g(x)}$, then the local minimum value of $h(x)$ is **[JEE - Main 2018]**

(A) -3 (B) $-2\sqrt{2}$ (C) $2\sqrt{2}$ (D) 3

10. The number of elements in the range of $f(x) = [x] + [2x] + \left[\frac{2}{3}x\right] + [3x] + [4x] + [5x]$ for $0 \leq x < 3$ is

1. Let $f: \mathbb{R} - \left\{\frac{-4}{3}\right\} \rightarrow \mathbb{R} - \left\{\frac{4}{3}\right\}$ be a function defined as $f(x) = \frac{4x}{3x+4}$. The inverse of f is the map

$g: \mathbb{R} - \left\{\frac{4}{3}\right\} \rightarrow \mathbb{R} - \left\{\frac{-4}{3}\right\}$ is given by

(A) $g(y) = \frac{3y}{3-4y}$

(B) $g(y) = \frac{4y}{4-3y}$

(C) $g(y) = \frac{4y}{3-4y}$

(D) $g(y) = \frac{3y}{4-3y}$
