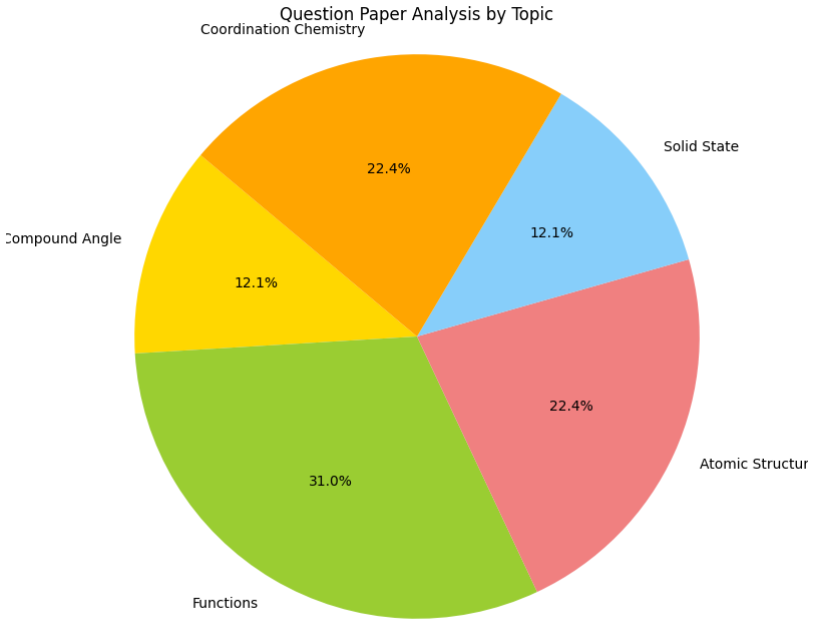
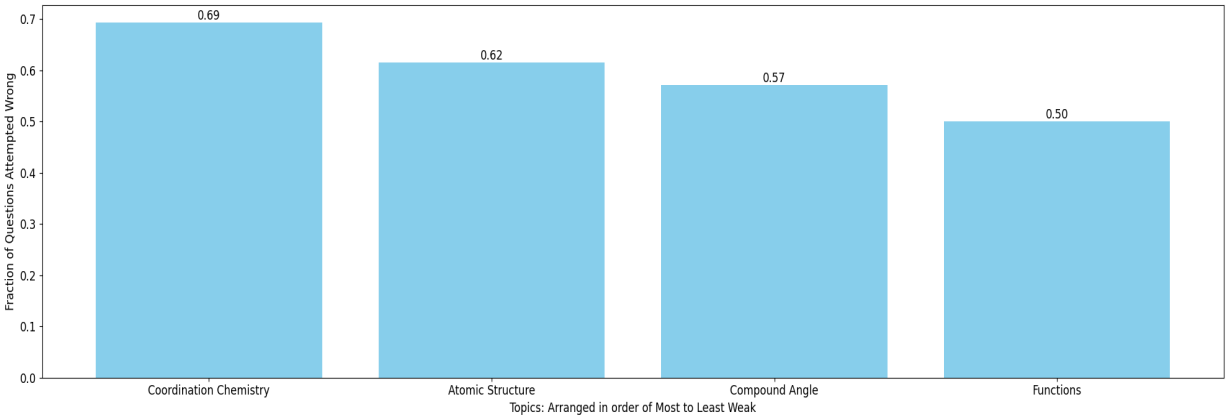
Shiva gahlod Total
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Coordination Chemistry:

11. Which of the following species is not expected to be a ligand

(A) NO^+ (B) NH_4^+ (C) $NH_2^- + NH_3^+$ (D) CO

66. The correct order of magnetic moments is:

(A) $[MnCl_4]^{2-} > [CoCl_4]^{2-} > [Fe(CN)_6]^{4-}$ (B) $[MnCl_4]^{2-} > [Fe(CN)_6]^{4-} > [CoCl_4]^{2-}$

(C) $[Fe(CN)_6]^{4-} > [MnCl_4]^{2-} > [CoCl_4]^{2-}$ (D) $[Fe(CN)_6]^{4-} > [CoCl_4]^{2-} > [MnCl_4]^{2-}$

75. The complex that can show fac- and mer-isomers is : **[JEE MAIN 2020]**

(1) $[Co(NH_3)_4Cl_2]^+$ (2) $[Pt(NH_3)_2Cl_2]$

(3) $[Co(NH_3)_3(NO_2)_3]$ (4) $[CoCl_2(en)_2]$

67. Which one of the following complexes is an outer orbital complex?

(A) $[Fe(CN)_6]^{4-}$ (B) $[Mn(CN)_6]^{4-}$

(C) $[Co(NH_3)_6]^{3+}$ (D) $[Ni(NH_3)_6]^{2+}$

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.

Atomic Structure:

52. A ball weighing 10 g is moving with a velocity of 90 ms^{-1}. If the uncertainty in its velocity is 5%, then the uncertainty in its position is_____ $\times 10^{-33}$ m. (Rounded off to the nearest integer)
[Given: $h = 6.63 \times 10^{-34}$ Js]
[JEE Main (April) 2021]

Ans. **1**

18. The binding energy of e– in ground state of hydrogen atom is 13.6 eV. The energies required to eject out an electron from three lowest states of He^+ ion will be – (in eV)
(A) 13.6, 10.2, 3.4 (B) 13.6, 3.4, 1.5 (C) 13.6, 27.2, 40.8 (D) 54.4, 13.6, 6

31. In a sample of H-atoms, electrons de-excite from a level 'n' to 1. The total number of lines belonging to Balmer series are two. If the electrons are ionized from level 'n' by photons of energy 13 eV. Then the kinetic energy of the ejected photoelectrons will be :
(A) 12.15 eV (B) 11.49 eV (C) 12.46 eV (D) 12.63 eV

13. The ionziation enthalpy of hydrogen atom is 1.312×10^6 J mol^{-1}. The energy required to excite the electron in the atom from n =1 to n =2 is **[AIEEE-2008]**
(1) 8.51×10^5 J mol^{-1} (2) 6.56×10^5 J mol^{-1} (3) 7.56×10^5 J mol^{-1} (4) 9.84×10^5 J mol^{-1}

---

61. Which quantum number is not related with Schrodinger equation

(A) Principal (B) Azimuthal

(C) Magnetic (D) Spin

Compound Angle:

9. The value of $(\sec\theta - \cos\theta)(\operatorname{cosec}\theta - \sin\theta)(\cot\theta + \tan\theta)$[wherever defined] is equal to
(A) 1 (B) -1 (C) 2 (D) -2

2. If $T_n = (\sin^n \theta + \cos^n \theta)$, then $\frac{T_5 - T_3}{T_7 - T_5}$ is equal to

(A) $\frac{T_1}{T_3}$ (B) $\frac{T_2}{T_4}$ (C) $\frac{T_5}{T_7}$ (D) $\frac{T_3}{T_7}$

12. The value of $\sum_{k=1}^{13} \frac{1}{\sin\left(\frac{\pi}{4}+\frac{(k-1)\pi}{6}\right)\sin\left(\frac{\pi}{4}+\frac{k\pi}{6}\right)}$ is equal to **[JEE Advanced 2016]**

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

17. Let a vertical tower AB have its end A on the level ground. Let C be the mid-point of AB and P be a point on the ground such that $AP = 2AB$. If $\angle BPC = \beta$, then $\tan\beta$ is equal to : **[JEE-Mains 2017]**

(A) $\frac{2}{9}$ (B) $\frac{4}{9}$ (C) $\frac{6}{7}$ (D) $\frac{1}{4}$

13. The expression $\frac{\tan A}{1-\cot A} + \frac{\cot A}{1-\tan A}$ can be written as : **[JEE-Mains 2013]**

(A) secA + cosecA (B) sinA cosA + 1

(C) secA cosecA + 1 (D) tanA + cotA

Functions:

5. Which one of the following function is surjective but not injective?

(A) $f: R \to R, f(x) = x^3 + x + 1$ (B) $f: [0, \infty) \to (0,1]; f(x) = e^{-|x|}$.

(C) $f: R \to R, f(x) = x^3 + 2x^2 - x + 1$ (D) $f: R \to R^+, f(x) = \sqrt{1 + x^2}$

10. Let $f: R \to R$ and $g: R \to R$ be two non-constant differentiable functions.

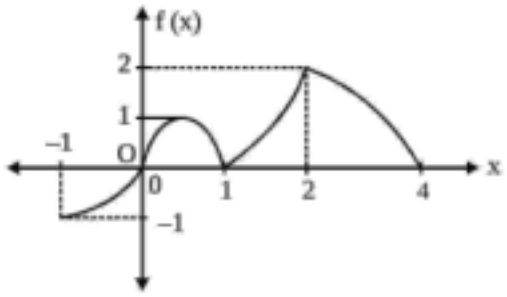
If $f'(x) = \left(e^{(f(x))-g(x)}\right)g'(x)$ for all $x \in R$, and $f(1) = g(2) = 1$, then which of the following statement(s) is (are) TRUE ? **[JEE Ad. 2018]**

(A) $f(2) < 1 - \log_e 2$ (B) $f(2) > 1 - \log_e 2$

(C) $g(1) > 1 - \log_e 2$ (D) $g(1) < 1 - \log_e 2$

1. If $f(x) = 4x^3 - x^2 - 2x + 1$ and $g(x) = \begin{cases} \text{Min.}\{f(t): 0 \le t \le x\} & ; 0 \le x \le 1 \\ 3 - x & ; 1 < x \le 2 \end{cases}$ then find the value of λ if $2\lambda = g(1/4) + g(3/4) + g(5/4)$

8. If graph of a function f(x) which is defined in $[-1,4]$ is shown in the adjacent figure then identify the correct statement(s).



(A) domain of $f(|x|-1)$ is $[-5,5]$

(B) range of $f(|x|+1)$ is $[0,2]$

(C) range of $f(-|x|)$ is $[-1,0]$

(D) domain of $f(|x|)$ is $[-3,3]$

37. Let a function $f : N \to N$ be defined by. **[JEE - Main 2022]**

$$f(x)=\begin{cases} 2n, & n=2,4,6,8,\ldots\ldots \\ n-1, & n=3,7,11,15,\ldots\ldots \\ \dfrac{n+1}{2}, & n=1,5,9,13,\ldots\ldots \end{cases}$$ then f is

(A) One-one but not onto

(B) Onto but not one-one

(C) Neither one-one nor onto

(D) one-one and onto