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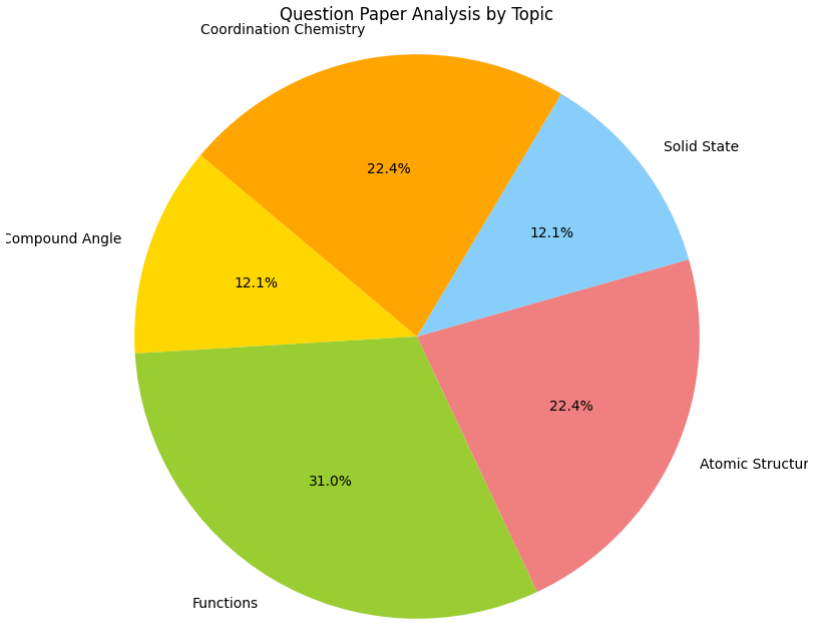
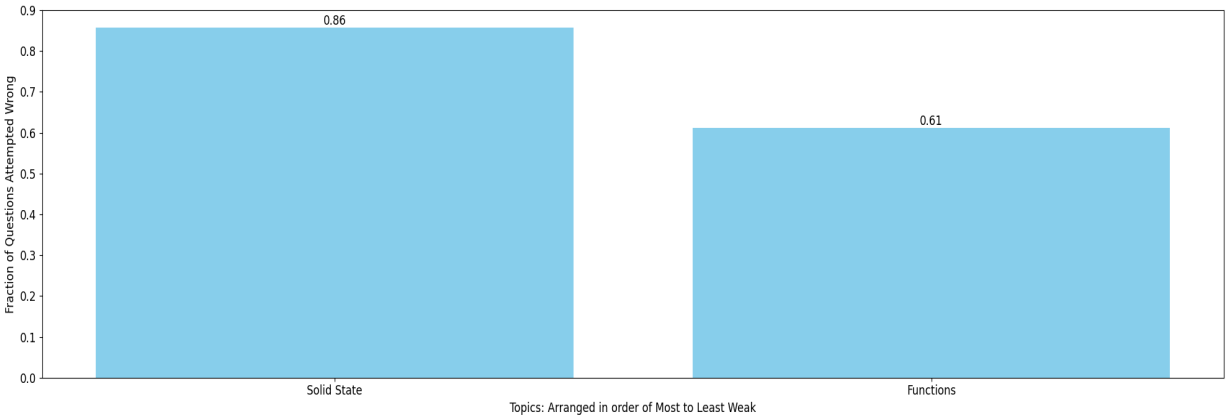
Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Solid State:

11. Gold crystallizes in a face centered cubic lattice. If the length of the edge of the unit cell is 407 pm, calculate the density of gold as well as its atomic radius assuming it to be spherical. Atomic mass of gold = 197 amu.

18. A metal crystallises in a face centred cubic structure. If the edge length of its unit cell is 'a', the closest approach between two atoms in metallic crystal will be **[Jee-Main (offline)-17]**

(A) $\sqrt{2}$ a (B) $\frac{a}{\sqrt{2}}$ (C) 2a (D) $2\sqrt{2}$ a

5. In a binary compound, atoms of element A form a hcp structure and those of element M occupy 2/3 of the tetrahedral voids of the hcp structure. The formula of the binary compound is: **[JEE Main, March 2021]**

(A) M_2A_3 (B) M_4A_3 (C) M_4A (D) MA_3

10. The effective radius of the iron atom is 1.42 Å. It has FCC structure. Calculate its density (Fe = 56 amu)

37. The edge length of a face centered cubic cell of an ionic substance is 508 pm. If the radius of the cation is 110 pm, the radius of the anion is: **[AIEEE-10]**

(A) 144 pm (B) 288 pm (C) 398 pm (D) 618 pm

Functions:

13. Let f(x) be a function such that $f(x-1)+f(x+1)=\sqrt{3}$ $f(x) \forall x \in R$. If $f(5)=100$, then $\sum_{r=0}^{49} f(5+12r)$

7. Let $f(x)=\frac{9^x}{9^x+3}$ then find the value of the sum $f\left(\frac{1}{2006}\right)+f\left(\frac{2}{2006}\right)+f\left(\frac{3}{2006}\right)+\cdots+f\left(\frac{2005}{2006}\right)$

10. Let $f(x)=\sin x-\cos^2 x$. If $f(x)=a$ has atleast one solution in $\left[0,\frac{\pi}{2}\right]$, then find the number of integral values of a. EXERCISE-2

INTERGER TYPE QUESTION

$(\text{Min}\{f(t):0\le t\le x\}\quad :0\le x\le 1$

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

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

1

1. (a) Let $P(x)=x^6+ax^5+bx^4+cx^3+dx^2+ex+f$ be a polynomial such that $P(1)=1; P(2)=2; P(3)=3; P(4)=4; P(5)=5$ and $P(6)=6$ then find the value of $P(7)$.

(b) Let a and b be real numbers and let $f(x)=a\sin x+b\sqrt[3]{x}+4, \forall x\in R$.

If $f(\log_{10}(\log_3 10))=5$ then find the value of $f(\log_{10}(\log_{10} 3))$.