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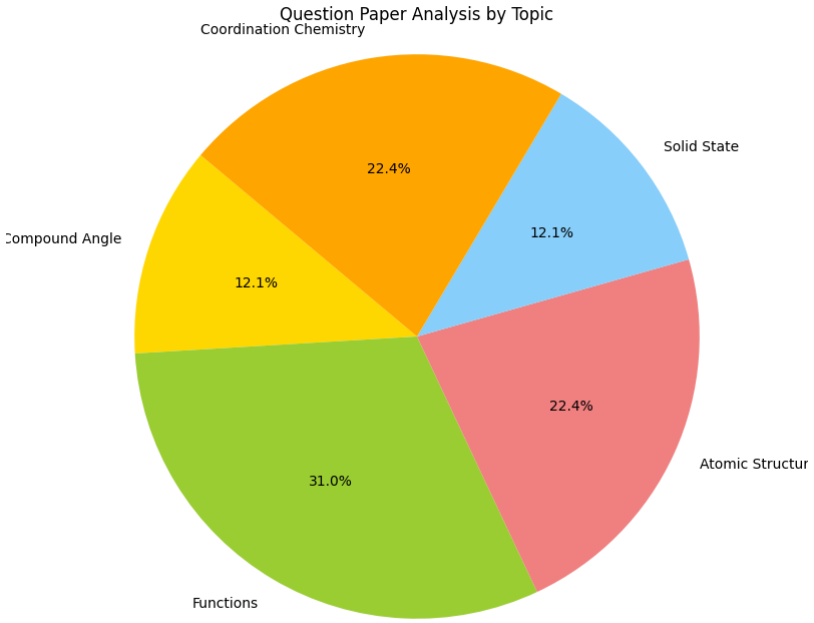
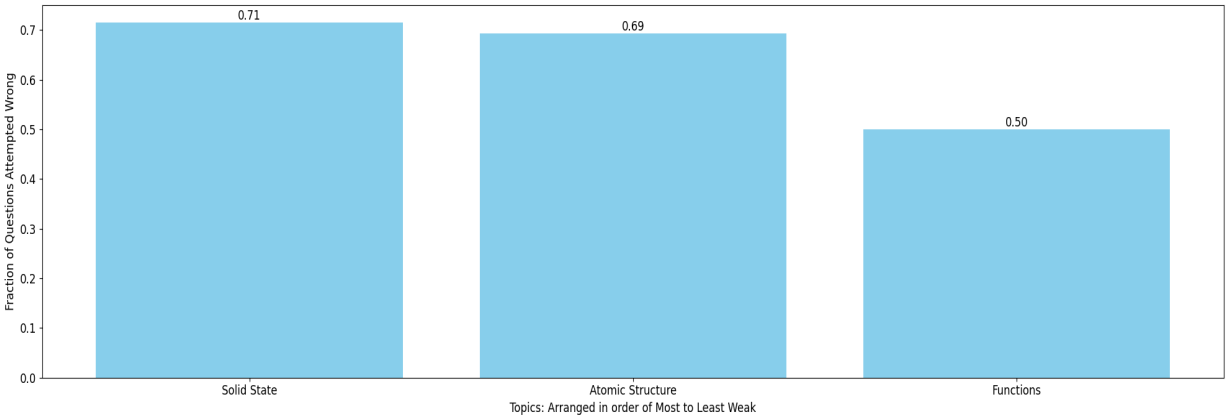
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Solid State:

31. Lithium forms body centred cubic structure. The length of the side of its unit cell is 351 pm. Atomic radius of the lithium will be: **[AIEEE-12]**

(A) 152 pm (B) 75 pm (C) 300 pm (D) 240 pm

4. The density of CaF_2 (fluorite structure) is 3.18 g/cm^3. The length of the side of the unit cell is

(A) 253 pm (B) 344 pm (C) 546 pm (D) 273 pm

24. In a monoclinic unit cell, the relation of sides and angles are respectively **[Jee-Main (online)-14]**

(A) $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma \neq 90^\circ$

(B) $a \neq b \neq c$ and $\beta = \gamma = 90^\circ \neq \alpha$

(C) $a = b \neq c$ and $\alpha = \beta = \gamma = 90^\circ$

(D) $a \neq b \neq c$ and $\alpha = \beta = \gamma = 90^\circ$

18. The nearest neighbour distance is:

(A) 154.5 pm (B) 309 pm (C) 218.5 pm (D) 260 pm

10. The most unsymmetrical system is:

(A) Cubic (B) Hexagonal (C) Triclinic (D) Orthorhombic

Atomic Structure:

56. What is uncertainty in location of a photon of wavelength 5000Å if wavelength is known to an accuracy of 1 pm?

(A) 7.96×10^{-14} m (B) 0.02 m

(C) 3.9×10^{-8} m (D) none

16. The energy of H–atom in n^{th} orbit is E_n then energy in n^{th} orbit of singly ionized helium atom will be:

(A) $4E_n$ (B) $E_n/4$ (C) $2E_n$ (D) $E_n/2$

24. The de Broglie wavelength of a car of mass 1000 kg and velocity 36 km/hr is :

($h = 6.63 \times 10^{-34}$ Js) **[JEE-Main(online) 2013]**

(1) 6.626×10^{-31} m (2) 6.626×10^{-34} m (3) 6.626×10^{-38} m (4) 6.626×10^{-30} m

18. For the given orbital in Column 1, the only CORRECT combination for any hydrogen- like species is

(A) (IV) (iv) (R) (B) (II) (ii) (P) (C) (III) (iii) (P) (D) (I) (ii) (S)

20. The electrons identified by quantum numbers n and l : **[AIEEE-2012]**

(a) $n = 4, \ell = 1$ (b) $n = 4, \ell = 0$ (c) $n = 3, \ell = 2$ (d) $n = 3, \ell = 1$

Can be placed in order of increasing energy as

(1) (a) < (c) < (b) < (d) (2) (c) < (d) < (b) < (a)

(3) (d) < (b) < (c) < (a) (4) (b) < (d) < (a) < (c)

Functions:

29. Let A = {1, 2, 3, ..., 10} and f: A → A be defined as $f(k) = \begin{cases} k+1 & \text{if k is odd} \\ k & \text{if k is even} \end{cases}$ Then the number of possible function g : A → A such that gof = f is **[JEE - Main 2021]**

(A) 105 (2) $^{10}C_5$ (3) 55 (4) 5!

$\cos ec^{-1} x$

9. Let f: I → I, defined as $f(x) = 2\sin(2\pi x) - 10\tan(5\pi x) + 7\cos(4\pi x) + 3$, then which of the following statement(s) is/are TRUE?

(A) f(x) is periodic function. (B) f(x) is an even function.

(C) f(x) is an odd function and its inverse exists. (D) $f(f(f(x))) = f(f(x))$ for all $x \in I$.

[Note : I denote the set of all integers.]

INTEGER TYPE

5. If the range of function $f(x) = \frac{x^2+7x+c}{x^2+2x+c}, x \in R$ is $\left[\frac{3}{6}, \frac{3}{2}\right]$ then c is equal to

(A) -4 (B) 3 (C) 4 (D) 5

41 $2-2|^2$

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 $2\lambda = g(1/4) + g(3/4) + g(5/4)$

3. Let f: $(-1,1) \to \mathbb{R}$ be such that $f(\cos 4\theta) = \frac{2}{2-\sec^2\theta}$ for $\theta \in \left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{4}, \frac{\pi}{2}\right)$. Then the value(s) of $f\left(\frac{1}{3}\right)$ is (are)- **[JEE 2012]**

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