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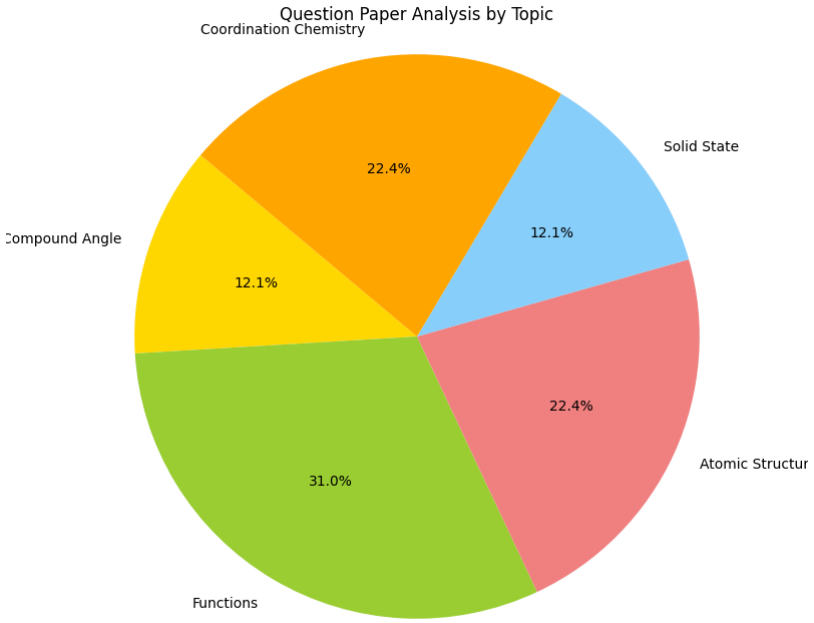
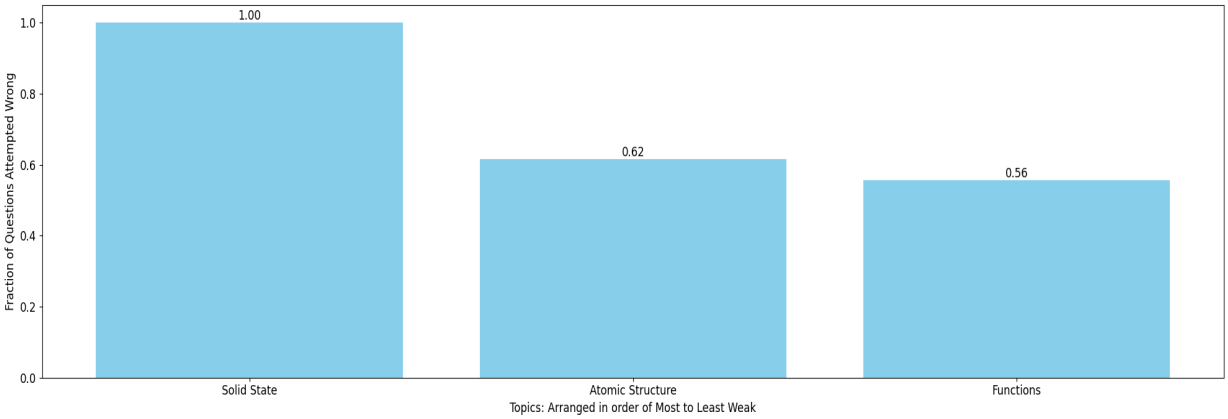
Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Solid State:

29. In a face centred cubic lattice, atoms of A form the corner points and atoms of B form the face centred points. If two atoms of A are missing from the corner points, the formula of the ionic compound is **[Jee-Main (online)-13]**

(A) AB_2 (B) AB_3 (C) AB_4 (D) A_2B_5

25. Percentage of void space in AB solid having rock salt structure if $\frac{r_+}{r_-} = \frac{1}{2}$ having cation anion contact.

Given $\pi = 3.15$.

PROBLEMS BASED ON ZnS, CsCl STRUCTURE

31. A non-stoichiometric compound Fe_7S_8 consist of iron in both Fe^{+2} and Fe^{+3} form and sulphur is present as sulphide ions. Calculate cation vacancies as a percentage of total cation in the sample.

33. A solid has 'bcc' structure. If the distance of nearest approach between two atoms is

26. **Column I** **Column II**

[Distance in terms of edge length of cube (a)]

Atomic Structure:

13. If the potential energy (PE) of hydrogen electron is –3.02eV then in which of the following excited level is electron present :–

(A) 1^{st} (B) 2^{nd} (C) 3^{rd} (D) 4^{th}

2. Rutherford's experiment , which established the nuclear model of atom, used a beam of :–

(A) β - particles, which impinged on a metal foil and get absorbed. **[JEE 2002]**

(B) γ - rays, which impinged on a metal foil and ejected electron.

(C) Helium atoms, which impinged on a metal foil and got scattered.

(D) Helium nuclei, which impinged on a metal foil and got scattered.

14. A single electron orbits a stationary nucleus of charge +Ze, where Z is a constant. It requires

28. If λ_0 and λ be the threshold wavelength and wavelength of incident light, the velocity of photoelectron ejected from the metal surface is **[JEE-Main(online) 2014]**

(1) $\sqrt{\frac{2hc}{m}\left(\frac{\lambda_0-\lambda}{\lambda\lambda_0}\right)}$ (2) $\sqrt{\frac{2h}{m}\left(\frac{1}{\lambda_0}-\frac{1}{\lambda}\right)}$ (3) $\sqrt{\frac{2h}{m}(\lambda_0-\lambda)}$ (4) $\sqrt{\frac{2hc}{m}(\lambda_0-\lambda)}$

57. The magnetic moment of a transition metal compound has been calculated to be 3.87 B.M. The metal ion is **[JEE Main (April) 2023]**

(A) Cr^{2+} (B) Ti^{2+} (C) V^{2+} (D) Mn^{2+}

Ans. **C**

Functions:

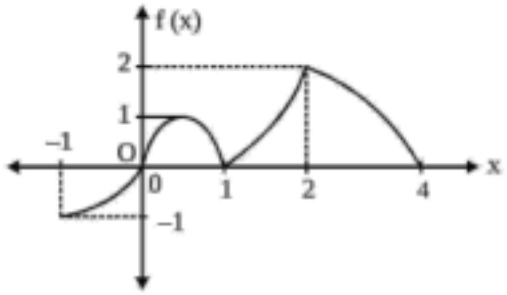
3. If $f(x)$ is defined on $(0,1)$, then the domain of definition of $f(e^x) + f(\ln|x|)$ is

(A) $(-e,-1)$ (B) $(-e,-1) \cup (1,e)$

(C) $(-\infty,-1) \cup (1,\infty)$ (D) $(-e,e)$

$f(2+x \quad x \geq 0$

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 $[-3,3]$

4. If $f(x) = -1 + |x-2|, 0 \le x \le 4$ $g(x) = 2 - |x|, -1 \le x \le 3$

Then find $f \circ g(x)$ & gof (x). Draw rough sketch of the graphs of fog(x) & gof(x).

5. Let $f: (-\infty, 2] \to [6, \infty)$ be defined as $f(x) = 4x^2 - 16x + 22$ and g(x) is a function such that graphs of f(x) and g(x) are mirror image of each other with respect to line $x - y = 0$, then g(10) is equal to

(A) 1 (B) 2 (C) 3 (D) 4

2. The function $f: [0,3] \to [1,29]$, defined by $f(x) = 2x^3 - 15x^2 + 36x + 1$, is : **[JEE 2012]**

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

(C) one-one but not onto (D) neither one-one nor onto