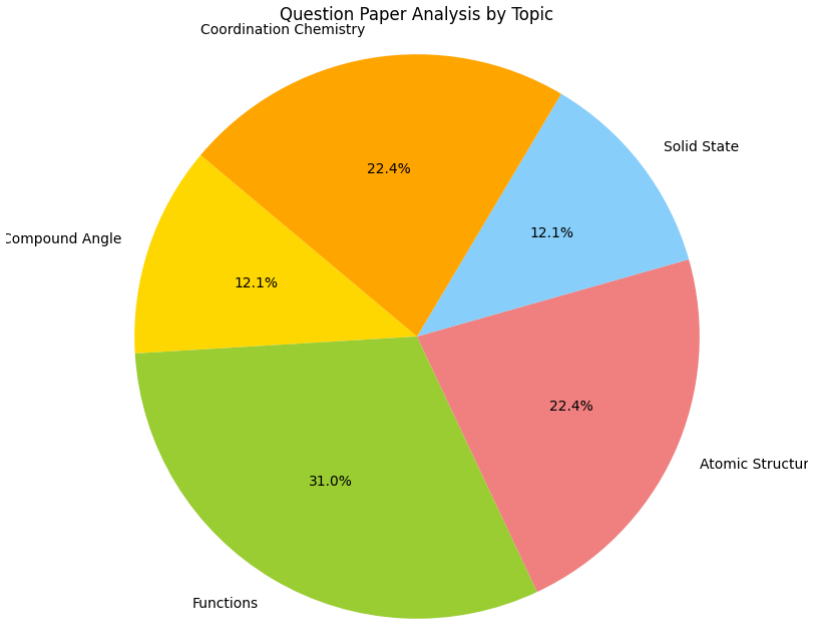
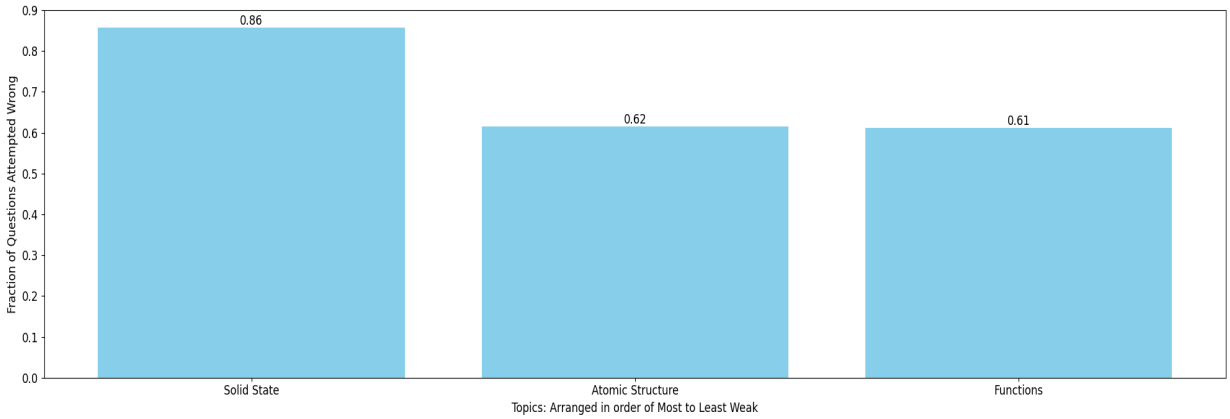
Parambrata Dutta Total
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Solid State:

5. Correct statement(s) for the packing of identical disc in two dimensions is/are:
(A) For square close packing, coordination number is 4.

12. An element crystallizes in a structure having FCC unit cell of an edge 200 pm. Calculate the density, if 200 g of this element contains 24×10^{23} atoms.

13. Iron crystallizes in several modifications. At about 910°C, the body-centered cubic '□' form undergoes a transition to the face-centered cubic '**γ**' form. Calculate the ratio of the density of □ iron to that of α iron at the transition temperature.

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.

41. An ionic compound has a unit cell consisting of A ions at the corners of a cube and B ions on the centres of the faces of the cube. The empirical formula of this compound would be–

[AIEEE-05]

(A) A_2B (B) AB (C) A_3B (D) AB_3

Atomic Structure:

51. Isotope(s) of hydrogen which emits low energy β–particles with $t_{\frac{1}{2}}$ value > 12 years is/are:

[JEE Main (April) 2021]

(A) Protium (B) Tritium

(C) Deuterium (D) Deuterium and Tritium

Ans. **B**

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61. Which quantum number is not related with Schrodinger equation

(A) Principal (B) Azimuthal

(C) Magnetic (D) Spin

39. What is the work function of the metal if the light of wavelength 4000 Å generates photoelectrons of velocity 6×10^5 ms^{-1} form it ?

(Mass of electron = 9×10^{-31} kg

Velocity of light = 3×10^8 ms^{-1}

Planck's constant = 6.626×10^{-34} Js

Charge of electron = 1.6×10^{-19} JeV^{-1})

[JEE Main (Jan.) 2019]

(1) 2.1 eV (2) 3.1 eV (3) 0.9 eV (4) 4.0 eV

37. A photon of energy hν is absorbed by a free electron of a metal having work function w < hν. Then :

(A) The electron is sure to come out

(B) The electron is sure to come out with a kinetic energy (hν – w)

(C) Either the electron does not come out or it comes with a kinetic energy (hν – w)

(D) It may come out with a kinetic energy less than (hν – w)

25. Three energy levels P, Q, R of a certain atom are such that $E_P < E_Q < E_R$. If λ_1, λ_2 and λ_3 are the wave length of radiation corresponding to transition R → Q ; Q → P and R→ P respectively. The correct relationship between λ_1, λ_2 and λ_3 is

(A) $\lambda_1 + \lambda_2 = \lambda_3$ (B) $\frac{1}{\lambda_3} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$ (C) $\lambda_3 = \sqrt{\lambda_1 \lambda_2}$ (D) $\frac{2}{\lambda_3} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$

Functions:

3. The area bounded by the graph of f(x) and the x-axis from $x = -1$ to $x = 9$ is

(A) $\frac{31}{2}$ (B) 15 (C) 12 (D) $\frac{15}{2}$

6. Let f: A → B and g: B → C be two functions and gof : A → C is defined. Then which of the following statement(s) is true?

(A) If gof is onto then f must be onto.

(B) If f is into and g is onto then gof must be onto function.

(C) If gof is one-one then g is not necessarily one-one.

(D) If f is injective and g is surjective then gof must be bijective mapping.

MULTIPLE CORRECT TYPE

$(x^2 - 4$ if $|x| < 3$

6. The value of (a + b) is equal to

(A) -2 (B) -1 (C) 0 (D) 1

32. Let f(x) be a polynomial of degree 3 such that $f(x) = -\frac{2}{k}$ for k = 2, 3, 4, 5. Then the value of 52 – 10 f(10) is equal to _____. **[JEE - Main 2021]**

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

(Min. {f(t): 0 ≤ t ≤ x) : 0 ≤ x ≤ 1