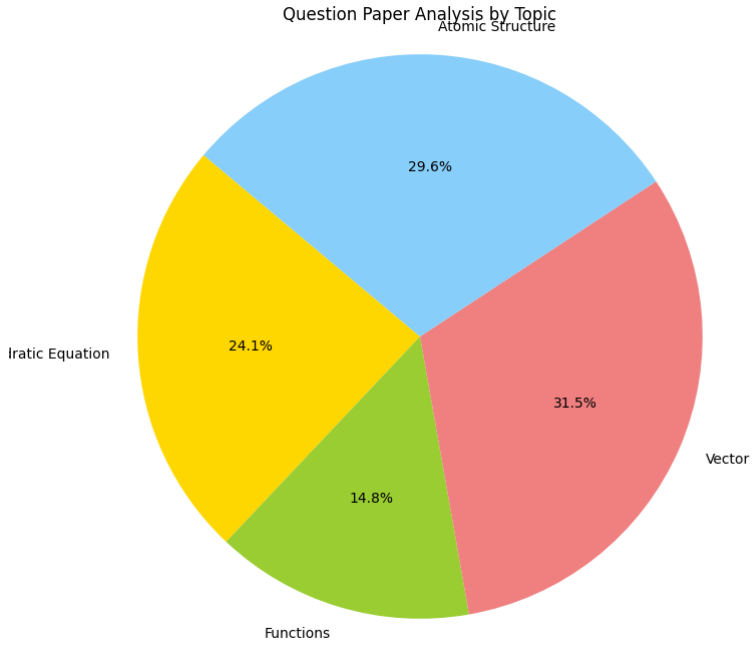
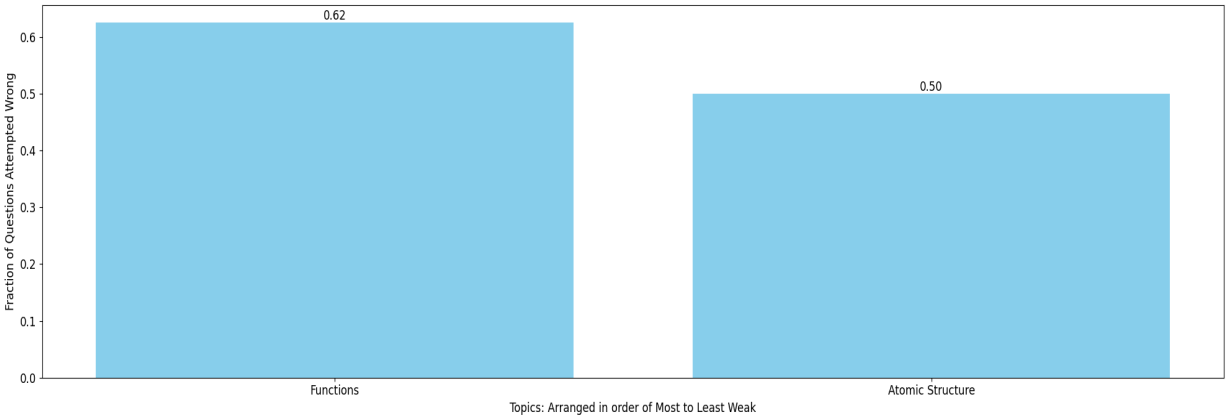
Samarth Rajput Total
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Functions:

18. The number of functions f from {1,2,3, ...20} onto {1, 2,3, ... ,20} such that f(k) is a multiple of 3, whenever k is a multiple of 4 , is **[JEE - Main 2019]**

(A) $(15)! \times 6!$ (B) $5^6 \times 15$ (C) $5! \times 6!$ (D) $6^5 \times (15)!$

14. If $f(x) = \left(\frac{1-x}{1+x}\right)$, $|x| < 1$, then $f\left(\frac{2x}{1+x^2}\right)$ is equal to **[JEE - Main 2019]**

(A) $2f(x)$ (B) $2f(x^2)$ (C) $(f(x))^2$ (D) $-2f(x)$

12. Let S =(0,1) ∪ (1,2) ∪ (3,4) and T = {0,1, 2,3). Then which of the following statements is(are) true? **[JEE Advanced 2023]**

(A) There are infinitely many functions from S to T

(B) There are infinitely many strictly increasing function from S to T

(C) The number of continuous functions from S to T is at most 120

(D) Every continuous function from S to T is differentiable

5. Find the period of $f(x) = \sin \frac{\pi}{4}[x] + \cos \frac{\pi x}{2}$, where [.] denotes greatest integer function.

12. Let $f(x) = ([a]^2 - 5[a] + 4)x^3 - (6\{a\}2 - 5\{a\} + 1)x - \text{sgn } x.$ (tan x) be an even function for $\forall x \in R$. If S be the sum of all possible values of 'a' then [S] is (Here [.] & {} represent greatest integer & fractional part functions respectively.)

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

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 $R \rightarrow Q$; $Q \rightarrow P$ and $R \rightarrow P$ 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) $\frac{2}{\lambda_3} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$

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}

1. The quantum numbers +1/2 and –1/2 for the electron spin represent: **[JEE 2001]**

(A) rotation of the electron in clockwise and anticlockwise direction respectively.

(B) rotation of the electron in anticlockwise and clockwise direction respectively.

(C) magnetic moment of the electron pointing up and down respectively.

(D) two quantum mechanical spin states which have no classical analogue

22. The angular momentum of an electron in a given orbit is J, Its kinetic energy will be :

(A) $\frac{1}{2}\frac{J^2}{mr^2}$ (B) $\frac{Jv}{r}$ (C) $\frac{J^2}{2m}$ (D) $\frac{J^2}{2\pi}$

Spectrum