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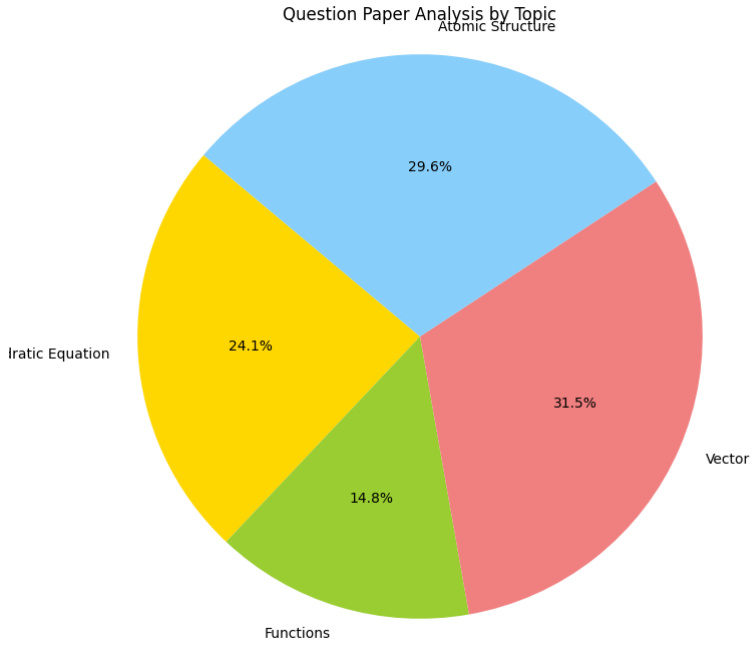
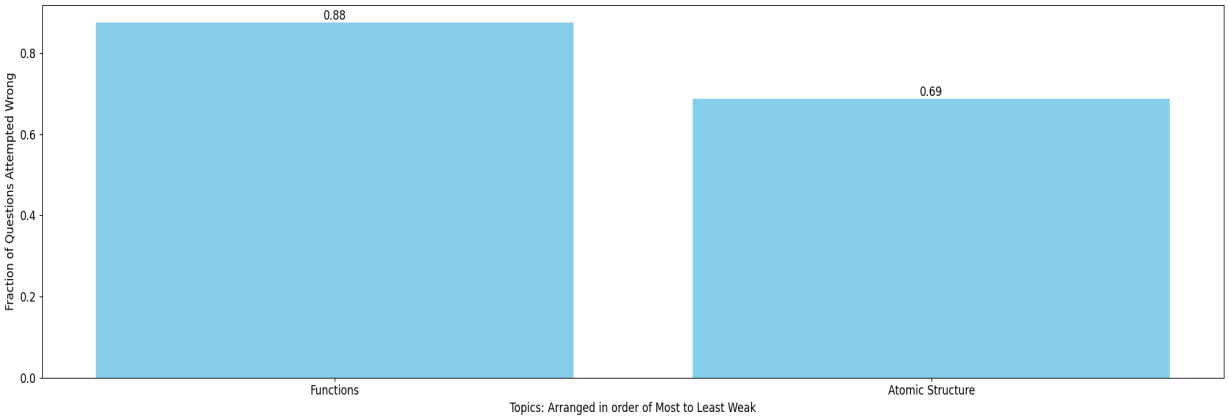
Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Functions:

17. Let a function f: $(0,\infty) \to (0,\infty)$ be defined by $f(x) = \left|1 - \frac{1}{x}\right|$. Then, f is **[JEE - Main 2019]**

(A) injective only

(B) both injective as well as surjective

(C) not injective but it is surjective

(D) neither injective nor surjective

5. If $f(x) + 2f\left(\frac{1}{x}\right) = 3x, x \neq 0$ and $S = \{x \in R: f(x) = f(-x)\}$; then S : **[JEE - Main 2016]**

(A) contains exactly one element.

(B) contains exactly two elements.

(C) contains more than two elements

(D) is an empty set.

34. It the minimum value of $f(x) = \frac{5x}{2} + \frac{\alpha}{x^5}, x > 0$ is 14, then the value of α is equal to: **[JEE - Main 2022]**

(A) 32 (B) 64 (C) 128 (D) 256

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

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

14. The period of the function

$$f(x) = \left(\sec^2\left(\frac{\pi x}{10}\right) - \tan^2\left(\frac{\pi x}{10}\right)\right)^{\cos^4 4\pi x + 100\{x\}}$$

(where {.}denotesfractionalpartfunction)isλ, then $(\lambda/2)$ is equal to

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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

18. The binding energy of e– in ground state of hydrogen atom is 13.6 eV. The energies required to eject out an electron from three lowest states of He^+ ion will be – (in eV)

(A) 13.6, 10.2, 3.4 (B) 13.6, 3.4, 1.5 (C) 13.6, 27.2, 40.8 (D) 54.4, 13.6, 6

12. Which is / are correct statement.

(A) The difference in angular momentum associated with the electron present in consecutive orbits of H-atom is (n–1) $\frac{h}{2\pi}$

(B) Energy difference between energy levels will be changed if, P.E. at infinity assigned value other than zero.

(C) Frequency of spectral line in a H-atom is in the order of $(2 \rightarrow 1) < (3 \rightarrow 1) < (4 \rightarrow 1)$

(D) On moving away from the nucleus, kinetic energy of electron decreases

3. The ratio of the energy of a photon of 2000 Å wavelength radiation to that of 4000 Å radiation is

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

8. A single electron is revolving orbits a round nucleus a stationary (z = 5). The energy required to excite the electron from the third to the fourth Bohr orbit will be :-

(A) 4.5 eV (B) 8.53 eV (C) 25 eV (D) 16.53 eV