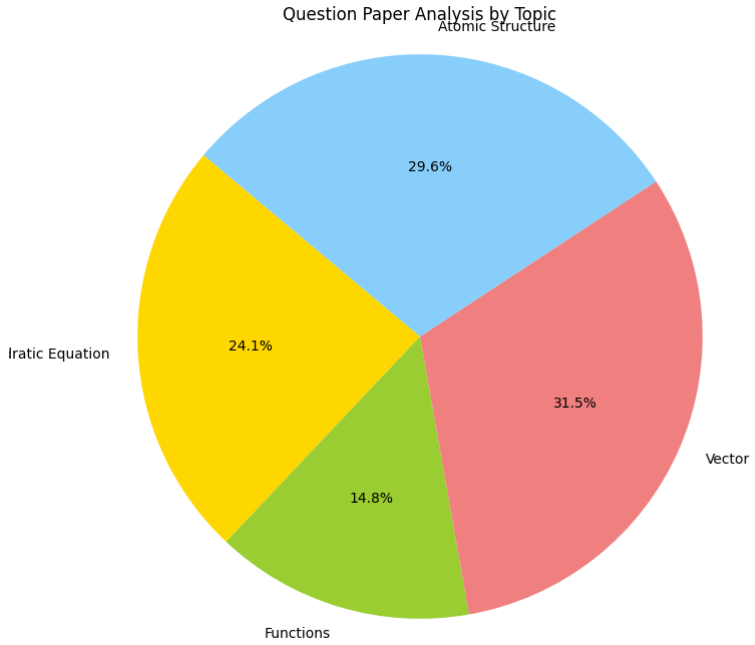
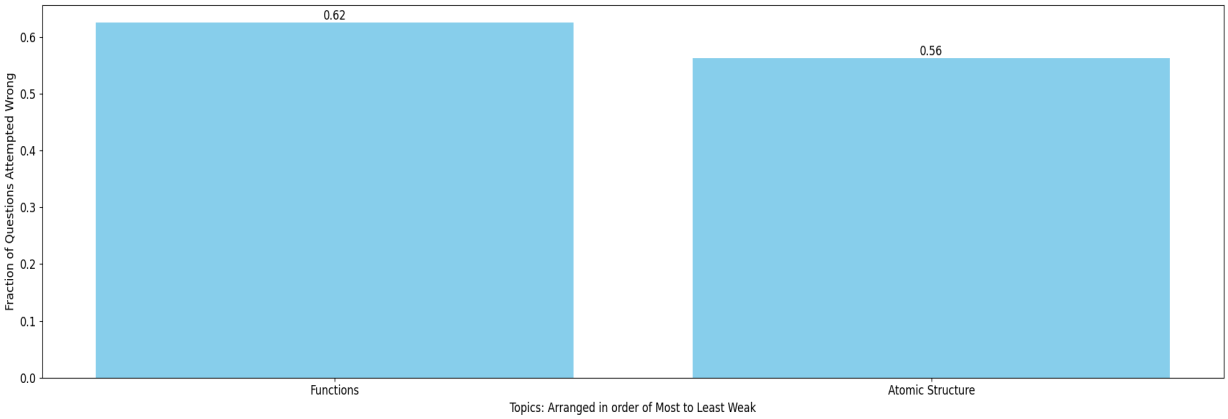
Ayush Pandey Total
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Functions:

10. Let f: R → R and g: R → R be two non-constant differentiable functions.

If $f'(x) = \left(e^{(f(x))-g(x)}\right)g'(x)$ for all $x \in R$, and $f(1) = g(2) = 1$, then which of the following statement(s) is (are) TRUE ? **[JEE Ad. 2018]**

(A) $f(2) < 1 - \log_e 2$ (B) $f(2) > 1 - \log_e 2$

(C) $g(1) > 1 - \log_e 2$ (D) $g(1) < 1 - \log_e 2$

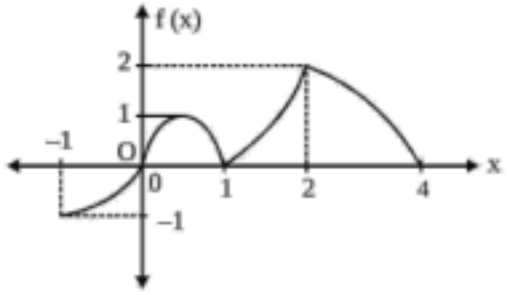
4. Number of solutions of the equation

$$\sum_{n=0}^{\infty} (\sin^2 x)^n + \sum_{n=0}^{\infty} (\cos^2 x)^n = 4 \text{ in } (0,2\pi) \text{ will be}$$

2. The function f(x) is defined by $f(x) = \cos^4 x + K\cos^2 2x + \sin^4 x$, where K is a constant. If the function f(x) is a constant function, the value of k is

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

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 $[-3,3]$

2. Which of the following equations have the same graphs?

I. $y = x - 2$

II. $y = \frac{(x^2-4)}{(x+2)}$

III. $(x + 2)y = x^2 - 4$

(A) I and II only.

(B) I and III only.

(C) II and III only.

(D) All the equations have different graphs.

Atomic Structure:

22. If the radius of first orbit of H atom is a_0, the de-Broglie wavelength of an electron in the third orbit is : **[JEE-Main(online) 2012]**

(1) $6\pi a_0$ (2) $8\pi a_0$ (3) $2\pi a_0$ (4) $4\pi a_0$

60. The wavelength of an electron of kinetic energy 4.50×10^{-29} J is _____ $\times 10^{-5}$ m. (Nearest integer) **[JEE Main (April) 2023]**

Given: Mass of electron is 9×10^{-31} kg, $h = 6.6 \times 10^{-34}$ Js

Ans. **7**

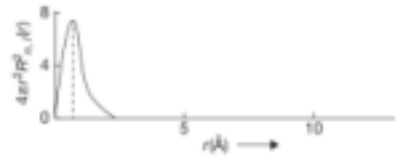
EXERCISE # (JEE-ADVANCE)

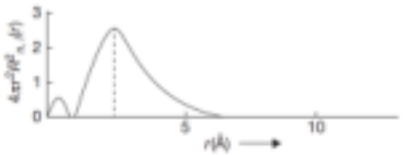
22. The angular momentum of an electron in a given orbit is J, Its kinetic energy will be :

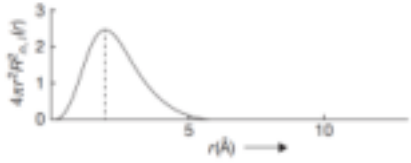
(A) $\frac{1}{2}\frac{J^2}{mr^2}$ (B) $\frac{Jv}{r}$ (C) $\frac{J^2}{2m}$ (D) $\frac{J^2}{2\pi}$

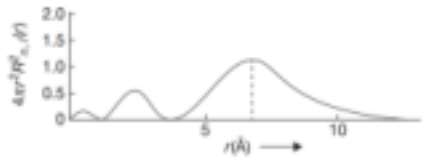
Spectrum

50. The plots of radial distribution functions for various orbitals of hydrogen atom against 'r' are given below: **[JEE Main (April) 2021]**

(A) 

(B) 

(C) 

(D) 

Ans. A

14. Choose the correct statement among the following

(A) Radial distribution function ($\Psi^2 \cdot 4\pi r^2 dr$) give probability at a particular distance along one chosen direction

(B) Ψ^2 (r) give probability density at a particular distance over a spherical surface

(C) For 's' orbitals $\Psi(r)\Psi(\theta)\Psi(\phi) = \Psi(x, y, z)$ is independent of θ and ϕ

(D) '2p' orbital with quantum numbers. n = 2, ℓ = 1, m = 0, also shows angular dependence