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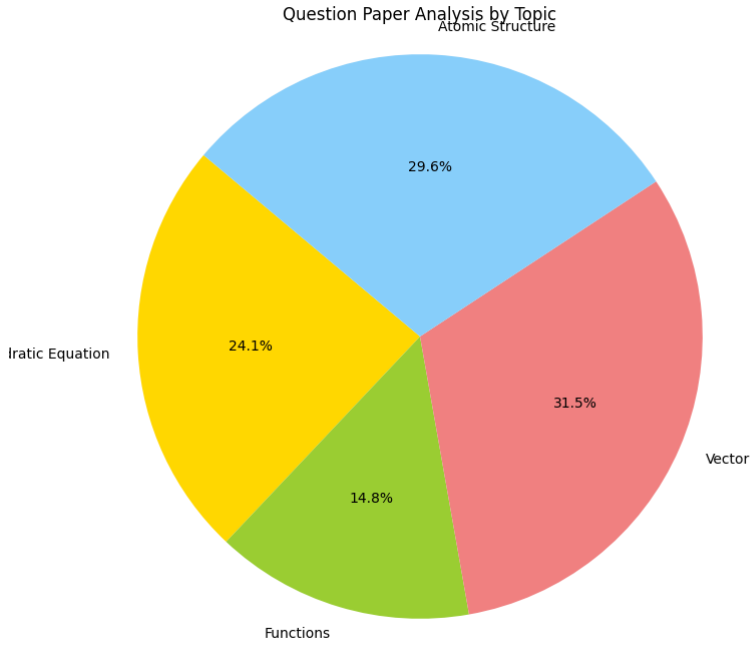
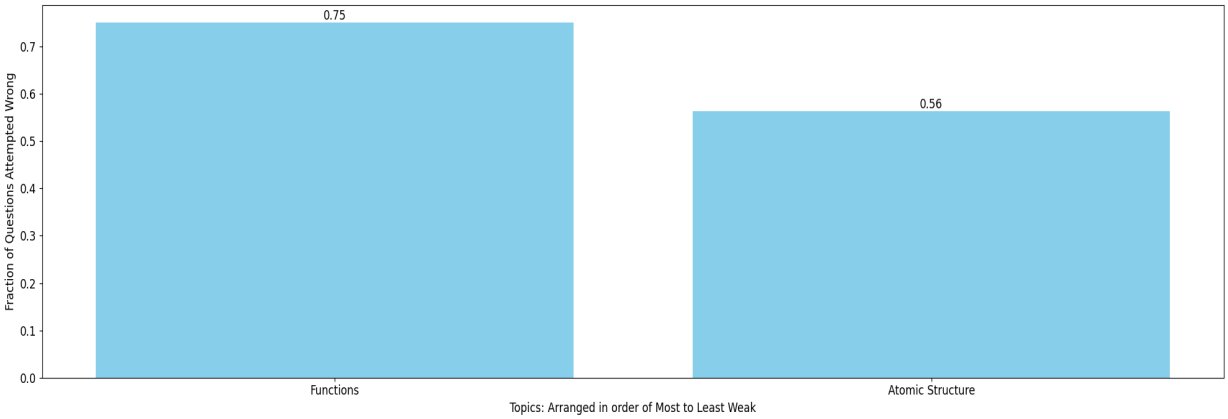
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Functions:

13. Let f(x) be a function such that $f(x-1)+f(x+1)=\sqrt{3}$ $f(x)\forall x \in R$. If $f(5)=100$, then $\sum_{r=0}^{49} f(5+12r)$

3. Let $f:(-1,1)\to\mathbb{R}$ be such that $f(\cos 4\theta)=\frac{2}{2-\sec^2\theta}$ for $\theta\in\left(0,\frac{\pi}{4}\right)\cup\left(\frac{\pi}{4},\frac{\pi}{2}\right)$. Then the value(s) of $f\left(\frac{1}{3}\right)$ is (are)- **[JEE 2012]**

(A) $1-\sqrt{\frac{3}{2}}$ (B) $1+\sqrt{\frac{3}{2}}$ (C) $1-\sqrt{\frac{2}{3}}$ (D) $1+\sqrt{\frac{2}{3}}$

9. Let a function f defined from $R\to R$ as

$$f(x)=\begin{cases}x+p^2, & \text{for } x\le 2\\ px+5, & \text{for } x>2\end{cases}$$

If the function is surjective, then find the sum of all possible integral values of p in $[-100,100]$.

41. Let $A=\{\lambda\in R:[x+3]+[x+4]\le\}$, $B=\left\{x\in R:3^x\left(\sum_{r=1}^{\infty}\frac{2}{10r}\right)^{(2x+1)}<3^{-3x}\right\}$, where [t] Denote greatest integer function. Then **[JEE - Main 2023]**

(A) $A\subset B, A\neq B$ (B) $A\cap B=\phi$ (C) $A=B$ (D) $B\subset C, A\neq B$

1. Let $f(x)=x^2$ and $g(x)=\sin x$ for all $x\in R$. Then the set of all x satisfying $(fogogof)(x)=(gogof)(x)$, where $(fog)(x)=f(g(x))$, is- **[JEE 2011]**

(A) $\pm\sqrt{n\pi}, n\in\{0,1,2,\ldots.$ (B) $\pm\sqrt{n\pi}, n\in\{1,2,\ldots\}$

(C) $\frac{\pi}{2}+2n\pi, n\in\{\ldots.,-2,-1,0,1,2,\ldots.$ (D) $2n\pi, n\in\{\ldots.,-2,-1,0,1,2,\ldots..$

Atomic Structure:

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) $\frac{2}{\lambda_3} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$

7. In a H-like sample electrons make transition from 5^{th} excited state to 2^{nd} excited state

(A) 10 different spectral lines will be emitted

(B) 6 different spectral lines will be emitted

(C) Number of lines belonging to Balmer series will be 4

(D) Number of lines belonging to Paschen series will be 3

32. The value of $(n_2 + n_1)$ and $\left(n_2^2 - n_1^2\right)$ for He^+ ion in atomic spectrum are 4 and 8 respectively. The wavelength of emitted photon when electron jump from n_2 to n_1 is

(A) $\frac{32}{9} R_H$ (B) $\frac{32}{9} R_H$ (C) $\frac{9}{32R_H}$ (D) $\frac{32}{9R_H}$

12. Uncertainty in the position of an electron (mass = 9.1×10^{-31} Kg) moving with a velocity 300 ms^{-1}, accurate upto 0.001%, will be :- ($h = 6.63 \times 10^{-34}$ Js) **[AIEEE-2006]**

(1) 5.76×10^{-2} m (2) 1.92×10^{-2} m (3) 3.84×10^{-2} m (4) 19.2×10^{-2} m

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. $n = 2$, $\ell = 1$, $m = 0$, also shows angular dependence