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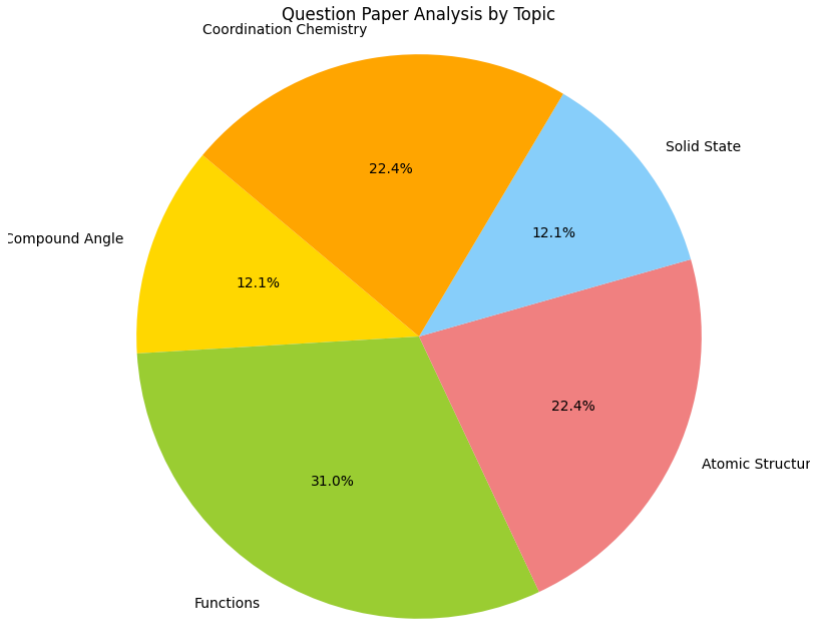
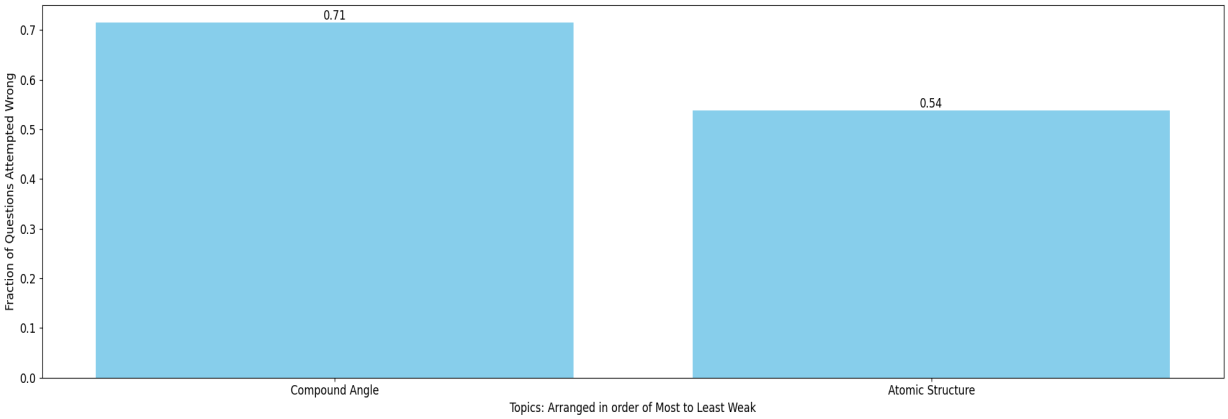
MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Compound Angle:

3. Prove that $\frac{\cos 4x+\cos 3x+\cos 2x}{\sin 4x+\sin 3x+\sin 2x} = \cot 3x$

$\cos\theta A \cos 5A - \cos 12A \cos\theta A$

8. Prove that $2\sec^2\theta - \sec^4\theta - 2\operatorname{cosec}^2\theta + \operatorname{cosec}^4\theta = \frac{1-\tan^6\theta}{\tan^4\theta}$.

5. If θ and ϕ are acute angles satisfying $\sin\theta = \frac{1}{2}, \cos\phi = \frac{1}{3}$, then $\theta + \phi \in$

[JEE 2004 (Screening)]

(A) $\left(\frac{\pi}{3}, \frac{\pi}{2}\right]$ (B) $\left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$ (C) $\left(\frac{2\pi}{3}, \frac{5\pi}{6}\right)$ (D) $\left(\frac{5\pi}{6}, \pi\right)$

11. If $A = \sin^2 x + \cos^4 x$, then for all real x **[AIEEE 2011]**

(A) $\frac{3}{4} \le A \le \frac{13}{16}$ (B) $\frac{3}{4} \le A \le 1$ (C) $\frac{13}{16} \le A \le 1$ (D) $1 \le A \le 2$

10. If $(1+\sin t)(1+\cos t) = \frac{5}{}$. Find the value of $(1-\sin t)(1-\cos t)$

Atomic Structure:

50. An electron in a hydrogen like atom makes transition from a state in which its de-Broglie wavelength is λ_1 to a state where its de-Broglie wavelength is λ_2 then wavelength of photon (λ) generated will be

(A) $\lambda = \lambda_1 - \lambda_2$ (B) $\lambda = \frac{4mc}{h}\left\{\frac{\lambda_1^2\lambda_2^2}{\lambda_1^2-\lambda_2^2}\right\}$

(C) $\lambda = \left\{\frac{\lambda_1^2\lambda_2^2}{\lambda_1^2-\lambda_2^2}\right\}$ (D) $\lambda = \frac{2mc}{h}\left\{\frac{\lambda_1^2\lambda_2^2}{\lambda_1^2-\lambda_2^2}\right\}$

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

34. Which of the following combination of statements is true regarding the interpretation of the atomic orbitals ? **[JEE Main (Jan.) 2019]**

(a) An electron in an orbital of high angular momentum stays away from the nucleus than an electron in the orbital of lower angular momentum.

(b) For a given value of the principal quantum number, the size of the orbit is inversely proportional to the azimuthal quantum number.

(c) According to wave mechanics, the ground state angular momentum is equal to $\frac{h}{2\pi}$.

(d) The plot of ψ Vs r for various azimuthal quantum numbers, shows peak shifting towards higher r value.

(1) (a), (c) (2) (a), (d) (3) (b), (c) (4) (a), (b)

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17. Statement-1: Energy emitted when an electron jump from $5 \rightarrow 2$ (energy level) is less than when an electron jump from $2 \rightarrow 1$ in all 'H' like atom.

Statement-2: The |total energy difference| between 1^{st} & 2^{nd} energy level is greater than that of any two energy level provided level '1' is not part of those two energy levels.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.

(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.

(C) Statement-1 is true, statement-2 is false.

(D) Statement-1 is false, statement-2 is true.

28. If λ_0 and λ be the threshold wavelength and wavelength of incident light, the velocity of photoelectron ejected from the metal surface is **[JEE-Main(online) 2014]**

(1) $\sqrt{\frac{2hc}{m}\left(\frac{\lambda_0-\lambda}{\lambda\lambda_0}\right)}$ (2) $\sqrt{\frac{2h}{m}\left(\frac{1}{\lambda_0}-\frac{1}{\lambda}\right)}$ (3) $\sqrt{\frac{2h}{m}(\lambda_0-\lambda)}$ (4) $\sqrt{\frac{2hc}{m}(\lambda_0-\lambda)}$