

## Master Math for JEE Main & JEE Advanced

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For JEE Main 2020 April



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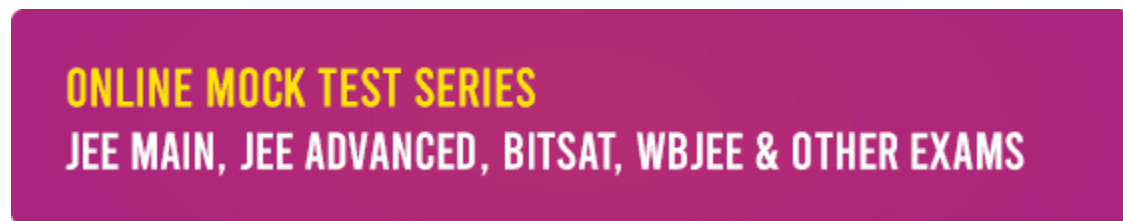
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## JEE Mains 2020 Jan Chapter wise Question Bank

## Atomic Structure

Q1

$n = 5, m_s = +\frac{1}{2}$  How many orbitals are possible:

$n = 5, m_s = +\frac{1}{2}$  के लिए कितने कक्षक सम्भव है ?

(1) 25

(2) 30

(3) 50

(4) 35

7<sup>th</sup> Jan Morning

Sol

(1)

Q2

Amongst the following which is not a postulate of Dalton's atomic theory

- (1) Matter is formed of indivisible atoms
- (2) Under identical conditions of pressure and temperature gases combine and give gaseous products in simple volume ratio.
- (3) During chemical reactions atoms remain conserved and only pass through rearrangement
- (4) Some atoms have same properties including atomic mass

7<sup>th</sup> Jan Morning

Sol

(2)

Refer Notes

Q3

Given, for H-atom

$$\frac{1}{\lambda} = R_H \left[ \frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

Select the correct options regarding this formula for Balmer series.

- (A)  $n_1 = 2$
- (B) Ionization energy of H atom can be calculated from above formula.
- (C)  $\lambda_{\text{maximum}}$  is for  $n_2 = 3$ .
- (D) If  $\lambda$  decreases then spectrum lines will converge.

Sol

(3)

Theory based.

Q4

Determine Bohr's radius of  $\text{Li}^{2+}$  ion for  $n = 2$ . Given (Bohr's radius of H-atom =  $a_0$ ) $n = 2$  के लिए  $\text{Li}^{2+}$  आयन की बोहर ऊर्जा का निर्धारण कीजिए। दिया है (H-परमाणु की बोहर त्रिज्या =  $a_0$ )

(1)  $\frac{3 a_0}{4}$

(2)  $\frac{4 a_0}{3}$

(3)  $\frac{a_0}{3}$

(4)  $\frac{16 a_0}{9}$

8<sup>th</sup> Jan Evening

Sol

(2)

$$r = \frac{a_0 n^2}{Z}$$

For  $\text{Li}^{2+}$  के लिए  $r = \frac{a_0 (2)^2}{3} = \frac{4 a_0}{3}$

Q5

Determine wavelength of electron in 4<sup>th</sup> Bohr's orbit ?4<sup>th</sup> बोहर कक्षा में इलेक्ट्रॉन की तरंगदैर्घ्य का निर्धारण कीजिए ?

(1)  $4 \pi a_0$

(2)  $2 \pi a_0$

(3)  $8 \pi a_0$

(4)  $6 \pi a_0$

9<sup>th</sup> Jan Morning

Sol

(3)

$$2 \pi r = n \lambda$$

$$2 \pi \times \frac{n^2}{Z} a_0 = n \lambda$$

$$2 \pi \times \frac{4^2}{1} a_0 = n \lambda$$

$$\lambda = 8 \pi a_0$$

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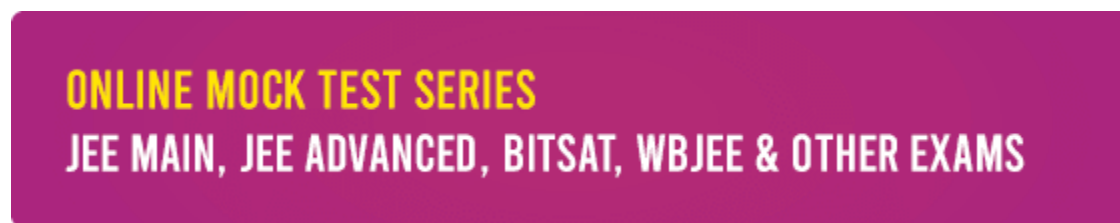
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