PhysicsByAaryan

CSIR NET . GATE . JEST . BARC - Physics

Angular momentum in Atomic Physics - CSIR NET Physics PYQs

Atomic and Molecular Physics . All PYQs (2015-2025) with answer key

3 questions . Answer key included

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Q1. [June 2018] . 5.0 marks

Atomic and Molecular Physics > Angular momentum in Atomic Physics

CSIR NET	2018 June	5M

The value of the Lande g - factor for a fine-structure level defined by the quantum number $L = 1, J = 2$ and $S = 1$, is

1. $\frac{11}{6}$
2. $\frac{4}{3}$
3. $\frac{8}{3}$
4. $\frac{3}{2}$

Q2. [June 2019] . 5.0 marks

Atomic and Molecular Physics > Angular momentum in Atomic Physics

CSIR NET	2019 June	5M

A doubly charged ion in the angular momentum state $(J = 2, J_3 = 1)$ meets a gas of polarized electrons $\left(S_3 = \frac{1}{2}\right)$ and gets neutralized. If the orbital angular momentum transferred in the process is zero, the probability that the neutral atom is in the $(J = 2, J_3 = 2)$ state is

1. $\frac{2}{5}$
2. $\frac{2}{3}$
3. $\frac{1}{5}$
4. $\frac{1}{3}$

Q3. [June 2020] . 5.0 marks

Atomic and Molecular Physics > Angular momentum in Atomic Physics

CSIR NET	2020 June	5M

If we take the nuclear spin I into account, the total angular momentum is $\vec{\mathrm{F}} = \vec{\mathrm{L}} + \vec{\mathrm{S}} + \vec{\mathrm{I}}$, where $\vec{\mathrm{L}}$ and $\vec{\mathrm{S}}$ are the orbital and spin angular momenta of the electron. The Hamiltonian of the hydrogen atom is corrected by the additional interaction $\lambda\vec{\mathrm{I}} \cdot (\vec{\mathrm{L}} + \vec{\mathrm{S}})$, where $\lambda > 0$ is a constant. The total angular momentum quantum number F of the p - orbital state with the lowest energy is

1. 0
2. 1
3. 1/2
4. 3/2

Answer Key

3 questions . Subject and topic for quick revision

Q. No	Subject	Topic	Answer
Q1	Atomic and Molecular Physics	Angular momentum in Atomic Physics	**4**
Q2	Atomic and Molecular Physics	Angular momentum in Atomic Physics	**4**
Q3	Atomic and Molecular Physics	Angular momentum in Atomic Physics	**2**

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