

PYQSide

NEET MOVING CHARGES AND MAGNETISM — MOTION OF A CHARGE IN A MAGNETIC FIELD — PYQS

Max. Marks: 44

Questions: 11

Section A (MCQ)

- Q.1** A model for quantized motion of an electron in a uniform magnetic field B states that the flux passing through the orbit of the electron is $n(h/e)$ where n is an integer, h is Planck's constant and e is the magnitude of electron's charge. According to the model, the magnetic moment of an electron in its lowest energy state will be (m is the mass of the electron)

[NEET (UG) 2025]

- (1) $\frac{heB}{\pi m}$ (2) $\frac{heB}{2\pi m}$ (3) $\frac{he}{\pi m}$ (4) $\frac{he}{2\pi m}$

Scan or tap for the full solution



- Q.2** Ionized hydrogen atoms and α -particles with same momenta enter perpendicular to a constant magnetic field, B . The ratio of their radii of their paths $r_H:r_\alpha$ will be :

[NEET (UG) 2019]

- (1) 1:2 (2) 4:1 (3) 1:4 (4) 2:1

Scan or tap for the full solution



- Q.3** An electron is moving in a circular path under the influence of a transverse magnetic field of 3.57×10^{-2} T. If the value of e/m is 1.76×10^{11} C kg $^{-1}$, the frequency of revolution of the electron is

[NEET 2016 (Phase 2)]

- (1) 1 GHz (2) 100 MHz
(3) 62.8 MHz (4) 6.28 MHz

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- Q.4** A proton and an alpha particle both enter a region of uniform magnetic field B , moving at right angles to the field B . If the radius of circular orbits for both the particles is equal and the kinetic energy acquired by proton is 1 MeV, the energy acquired by the alpha particle will be

[AIPMT 2015]

- (1) 1.5 MeV (2) 1 MeV
(3) 4 MeV (4) 0.5 MeV

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- Q.5** A proton carrying 1 MeV kinetic energy is moving in a circular path of radius R in uniform magnetic field. What should be the energy of an α -particle to describe a circle of same radius in the same field?

[AIPMT 2012 (Mains)]

- (1) 2 MeV (2) 1 MeV
(3) 0.5 MeV (4) 4 MeV

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- Q.6** Under the influence of a uniform magnetic field, a charged particle moves with constant speed v in a circle of radius R . The time period of rotation of the particle

[AIPMT 2009]

- (1) depends on R and not on v
(2) is independent of both v and R
(3) depends on both v and R
(4) depends on v and not on R

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- Q.7** A particle of mass m , charge Q and kinetic energy T enters a transverse uniform magnetic field of induction $\vec{B}$. After 3 seconds the kinetic energy of the particle will be

[AIPMT 2008]

- (1) T (2) $4T$ (3) $3T$ (4) $2T$

Scan or tap for the full solution



- Q.8** Under the influence of a uniform magnetic field, a charged particle moves with constant speed v in a circle of radius R . The time period of rotation of the particle

[AIPMT 2007]

- (1) depends on R and not on v
(2) is independent of both v and R
(3) depends on both v and R
(4) depends on v and not on R

Scan or tap for the full solution



- Q.9** In a mass spectrometer used for measuring the masses of ions, the ions are initially accelerated by an electric potential V and then made to describe semicircular paths of radius R using a magnetic field B . If V and B are kept constant, the ratio $\left(\frac{\text{charge on the ion}}{\text{mass of the ion}}\right)$ will be proportional to

[AIPMT 2007]

- (1) $1/R^2$ (2) R^2 (3) R (4) $1/R$

Scan or tap for the
full solution



- Q.10** A charged particle moves through a magnetic field in a direction perpendicular to it. Then the

[AIPMT 2003]

- (1) speed of the particle remains unchanged
(2) direction of the particle remains unchanged
(3) acceleration remains unchanged
(4) velocity remains unchanged

Scan or tap for the
full solution



- Q.11** An electron having mass m and kinetic energy E enters a uniform magnetic field B perpendicularly, then its frequency will be

[AIPMT 2001]

- (1) $\frac{eE}{qvB}$ (2) $\frac{2\pi m}{eB}$ (3) $\frac{eB}{2\pi m}$ (4) $\frac{2m}{eBE}$

Scan or tap for the
full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	4	4	1	2	2	2	1	2	1	1	3