PHYSICS

BOOKS - PUNJAB BOARD PREVIOUS YEAR PAPERS

FORCE ON A CHARGE

Exercise

1. An ion carrying a charge $3.2 \times 10^{-19} C$ is revolving in circular path in a magnetic field of

intensity $2 \times 10(-4)$ Tesla.Calculate the frequency of revolution if the mass of ion is 7.0×10^{-27} kg.

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3. An ion of mass $2.8 \times 1O^{-26}$kg carrying a charge $3.2 \times 10^{-19}C$ is revolving in circular path in a magnetic field of intensity 8×10^{-4} Tesla. Calculate the frequency of revolution.

4. Find the flux density of the magnetic field to cause 62.5eV electron to move in a circular path of the radius 5cm. Given $m = 9.1 \times 10^{-31}$,kg, e = $1.6 \times 10^{-19}C$

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5. Find the ratio of radii of the circles covered by a proton and alpha particles when both enter same uniform magnetic field perpendicularly with same kinetic energy.

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6. An electron is moving with speed 10*6 ms-1 parallel to a current of 5A flowing through an

infinitely long straight wire separated by a perpendicular distance of 10 cm in air. Calculate the magnitude of the force experienced by the electron. Given $\left(\mu_0 = 4\pi \times 10^{-7} TmA^{-1}\right)$

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7. Under what condition is the force acting on a charge moving through a uniform magnetic field maximum ?

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8. What is the direction of force acting on a charged particle 'q' moving with a velocity $\overrightarrow{v}$ in a unifom magnetic field $\overrightarrow{b}$?

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9. A particle of charge 'q'moves with a velocity v at an angle '0' to a magnetic field 'B'. What is the force experienced by the particle ?

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10. Why neutrons cannot be accelerated by cyclotron ?

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11. Why neutrons cannot be accelerated by cyclotron ?

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12. How much force will be experienced by a cahrge in a uniform magnetic field?

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13. What is the magnetic force experiencedby a stationary charge exposed to a uniform magnetic field ?

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14. Cyclotron is not suitable for accelerating electrons.' Explain why.

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15. If an electron is not deflected in passing through a certain region of space, can we be sure that there is no magnetic field in that region ?

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16. Withthe help of a suitable diagram, explain the construction, working and theory of cyclotron.

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19. Discuss the motion of a charged particle in uniform magnetic field, when it moves at an angle 0 with the direction of magnetic field. Prove that its path is helical.Calculate the pitch of the helical path.What will be the

nature of the path, if (i) $\theta = 0^\circ$ and $(ii)\theta = 180^\circ$?

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20. Withthe help of a suitable diagram, explain the construction, working and theory of cyclotron.

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21. Explain the principle, construction and working of a cyclotron with the help of a labelled diagram. State its two limitations.

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24. Withthe help of a suitable diagram, explain the construction, working and theory of cyclotron.

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25. An electric charge enters in electric field at right angles to the direction of electric field.What is the nature of the path followed ?

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27. Withthe help of a suitable diagram, explain the construction, working and theory of cyclotron.

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28. Cyclotron is not suitable for accelerating electrons.' Explain why.

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29. What will be the path of a charged particle moving perpendicular to a uniform magnetic field ?

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30. Explain the principle, construction and working of a cyclotron with the help of a labelled diagram. State its two limitations.

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31. With the help of labelled diagram, give the principle, construction and theory of cylotron.


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