# QB365 Question Paper Software
## 12th Standard - Physics
## Moving Charges and Magnetism Assertion and reason

Exam Time: 00:20 Hrs | Date: 2025-09-30

Total Marks: 10

## Questions:

1. **Assertion (A) :** Voltmeter is connected in parallel with the circuit.
   **Reason (R) :** Resistance of a voltmeter is very large.
   **Codes:**
   (a) Both A and R are true and R is the correct explanation of A
   (b) Both A and R are true but R is NOT the correct explanation of A
   (c) A is true but R is false
   (d) A is false and R is also false

2. **Assertion (A) :** When a charged particle moves perpendicular to magnetic field then its kinetic energy and momentum gets affected.
   **Reason (R) :** Force changes velocity of charged particle.
   **Codes:**
   (a) Both A and R are true and R is the correct explanation of A
   (b) Both A and R are true but R is NOT the correct explanation of A
   (c) A is true but R is false
   (d) A is false and R is also false

3. **Assertion (A)** : Magnetic moment is measured in joule/tesla or amp $m^2$.
   **Reason (R) :** Joule/tesla is equivalent to amp $m^2$
   **Codes:**
   (a) Both A and R are true and R is the correct explanation of A
   (b) Both A and R are true but R is NOT the correct explanation of A
   (c) A is true but R is false
   (d) A is false and R is also false

4. Assertion (A): A proton and an electron, with same momenta, enter in a magnetic field in a direction at right angles to the lines ofthe force. The radius of the paths followed by them willbe same.
   Reason (R) : Electron has less mass than the proton.
   (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
   (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
   (c) Assertion is true but Reason is false.
   (d) Assertion is false but Reason is true.

5. **Assertion :** Cyclotron does not accelerate electron.
   **Reason :** Mass of the electrons is very small.
   **Codes:**
   (a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
   (b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.

6. **Assertion :** The magnetic field produced by a current carrying solenoid is independent of its length and cross-sectional area.
**Reason :** The magnetic field inside the solenoid is uniform.
**Codes:**
(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.

7. **Assertion :** If the current in a solenoid is reversed in direction while keeping the same magnitude, the magnetic field energy stored in the solenoid remains unchanged.
**Reason :** Magnetic field energy density is proportional to the magnetic field.
**Codes:**
(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.



8. **Assertion :** Free electrons always keep on moving in a conductor even then no magnetic force act on them in magnetic field unless a current is passed through it.
**Reason :** The average velocity of free electron is zero.
**Codes:**
(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is correct but Reason is incorrect.
(d) If both the Assertion and Reason are incorrect.

9. **Assertion:** If an electron is not deflected when moving through a certain region of space, then the only possibility is that no magnetic field is present in that region.
**Reason:** Force on electron is directly proportional to the strength of the magnetic field.
**Codes:**
A) Both A and R are true and R is the correct explanation of A
B) Both A and R are true but R is NOT the correct explanation of A
C) A is true but R is false
D) A is false and R is true

10. **Assertion :** An electron and a proton moving with same velocity enters a magnetic field. The force experienced by the proton is more than the force experienced by the electron.
**Reason**: The mass of proton is more than the mass of the electron.
**Codes:**
A) Both A and R are true and R is the correct explanation of A
B) Both A and R are true but R is NOT the correct explanation of A

C) A is true but R is false
D) A is false and R is true

## Answers Key:

1. **(a):** A voltmeter is always connected in parallel. This has a large resistance.
2. **(d):** When a charged particle moves perpendicular to magnetic field, it experiences a force which changes the direction of motion of the particle without changing the magnitude of velocity of the particle. Hence kinetic energy remains constant but momentum of electron changes.
3. **(a):** Magnetic. moment $= \frac{\text{joule}}{\text{tesla}} = \frac{W}{B} = \frac{W}{F/qv}$
   $= \frac{Wqv}{F} = \frac{[\mathrm{ML^2\,T^{-2}}][\mathrm{AT}][\mathrm{LT^{-1}}]}{[\mathrm{MLT^{-2}}]}$
   $= \mathrm{AL}^2 = \mathrm{ampm}^2$
4. (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
5. (c) If the Assertion is correct but Reason is incorrect.
6. (b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
7. (c) If the Assertion is correct but Reason is incorrect.
8. (b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
9. A) Both A and R are true and R is the correct explanation of A
10. D) A is false and R is true