J.J. Thomson Experiment | Saitechinfo NEET JEE Academy Worksheet

1. In J.J. Thomson's experiment, a cathode ray is deflected by an electric field. The direction of deflection indicates that the cathode rays consist of:
    - a) Positively charged particles
    - b) Negatively charged particles
    - c) Neutral particles
    - d) Both positively and negatively charged particles
2. The charge-to-mass ratio (e/m) of the electron determined by J.J. Thomson is given by the formula:
    - a) $\frac{2V}{B^2 r^2}$
    - b) $\frac{2V}{B^2 v^2}$
    - c) $\frac{B^2 r^2}{2V}$
    - d) $\frac{B^2 v^2}{2V}$
3. In J.J. Thomson's experiment, if the electric field is turned off and only the magnetic field is applied, the radius of the electron's path:
    - a) Increases
    - b) Decreases
    - c) Remains the same
    - d) Becomes zero
4. The velocity of the electrons in J.J. Thomson's experiment can be calculated using:
    - a) $v = E/B$
    - b) $v = B/E$
    - c) $v = B \times E$
    - d) $v = E + B$
5. The deflection of the cathode rays in J.J. Thomson's experiment is used to measure:
    - a) The mass of the electron
    - b) The charge of the electron
    - c) The charge-to-mass ratio (e/m) of the electron
    - d) The velocity of the electron
6. If the electric field is E and the magnetic field is B, and they are applied perpendicular to each other, the resulting path of the electron in J.J. Thomson's experiment is:
    - a) A straight line
    - b) A circular path
    - c) A helical path
    - d) A parabolic path
7. If the magnetic field in J.J. Thomson's experiment is doubled, the charge-to-mass ratio (e/m) of the electron:
    - a) Doubles
    - b) Halves
    - c) Remains the same
    - d) Becomes zero
8. In J.J. Thomson's experiment, the role of the phosphorescent screen is to:

- a) Generate electrons
- b) Detect the electrons after deflection
- c) Provide the electric field
- d) Provide the magnetic field

9. The potential difference applied in J.J. Thomson's experiment is 2000 V, and the magnetic field is 0.1 T. If the radius of the electron's circular path is 0.02 m, the charge-to-mass ratio (e/m) of the electron is:
    - a) 1.8×10^{11} C/kg
    - b) 1.76×10^{11} C/kg
    - c) 1.60×10^{11} C/kg
    - d) 1.78×10^{11} C/kg

10. J.J. Thomson's experiment demonstrated that cathode rays are:
    - a) Electromagnetic waves
    - b) Streams of neutral particles
    - c) Streams of electrons
    - d) Streams of protons

Answer Key:

1. b
2. a
3. a
4. a
5. c
6. a
7. c
8. b
9. b
10. c