Work Sheet 3 : Cathode Rays & Electron Properties

2027

Part A – Multiple Choice Questions

1. Which of the following statements about cathode rays is TRUE
   - A. They are deflected towards the negative side in an electric field
   - B. They have no charge
   - C. They always travel in circular paths
   - D. They cast sharp shadows
   - E. They originate from the anode

2. Who demonstrated that cathode rays can turn a paddle wheel?
   - A. Crookes
   - B. R.A. Millikan
   - C. J.J. Thomson
   - D. Plücker
   - E. Rutherford

3. The deflection of cathode rays in an electric field proves that:
   - A. They are positively charged
   - B. They have no charge
   - C. They are composed of waves only
   - D. They carry a negative charge
   - E. They are made of photons

4. Cathode rays are produced:
   - A. At the anode in an evacuated tube
   - B. At the positive electrode
   - C. In a magnetic field
   - D. In the presence of air
   - E. At the cathode in an nearly evacuated tube

5. The sharp shadows cast by cathode rays provide evidence for:
   - A. Their mass
   - B. Their wave nature
   - C. Their particle nature
   - D. Their magnetic nature
   - E. Their charge

6. Which scientist is associated with measuring the charge of the electron?
    - A. Rutherford
    - B. Crookes
    - C. J.J. Thomson
    - D. R.A. Millikan
    - E. Bohr

7. Plücker's experiment with a magnetic field demonstrated that cathode rays are:
    - A. Deflected by gravity
    - B. Reflected by mirrors
    - C. Composed of sound waves
    - D. Absorbed by metal
    - E. Deflected by magnetic fields

8. The paddle wheel experiment suggested that cathode rays:
    - A. Carry energy and mass
    - B. Consist of light waves
    - C. Are immobile
    - D. Do not do work
    - E. Only travel in air

9. Wave-particle duality in electrons is illustrated by:
    - A. Their inability to deflect
    - B. Their positive charge
    - C. Their motion in liquids
    - D. Producing sound
    - E. Casting shadows and having mass

10. J.J. Thomson’s model was developed from his experiments using:

    - A. Light prisms
    - B. CRT (Cathode Ray Tube)
    - C. Oil drop apparatus
    - D. Geiger counter
    - E. Photographic plates

Part B – Short Answer Questions:

1. What is the significance of the paddle wheel experiment in understanding cathode rays?

2. How do cathode rays behave when placed in an electric field, and what does this suggest about their nature?

3. Explain how cathode rays demonstrate both wave and particle nature giving one evedance.

4. Describe one experiment that proves cathode rays have energy.

5. What did J.J. Thomson conclude from his cathode ray experiments?