Blue Print (As per PU Board)

Topic	1 mark questions	2 marks questions	3 marks questions	5 marks questions	Total Marks
Structure of Atom	–	–	–	2	10

One mark questions

1. **What are cathode rays (cathode ray particles)?**
   Answer: The particles moving in the discharge tube from cathode to anode.
2. **Name the fundamental particle of an atom that has highest value for its e/m value**
   Answer: Electron.
3. **What is the value of Rydberg's constant in joule?**
   Answer: 2.18×10^{-18} J
4. **Name the series of spectral line of hydrogen obtained in visible region.**
   Answer: Balmer series
5. **Write an expression to calculate the wave number of a spectral line in the hydrogen spectrum.**
   Answer: $\bar{\gamma} = R_H\left(\frac{1}{n1^2}-\frac{1}{n2^2}\right)\text{cm}^{-1}$
6. **What is Zeeman effect?**
   Answer: The splitting of spectral lines in the presence of magnetic field.

Two marks questions

7. **State Heisenberg's uncertainty principle.**
   Answer: It is impossible to determine simultaneously the exact position and exact momentum of an electron."
8. **Write any two limitations of Bohr's model of an atom.**
   Answer: It fails to accounts for the finer details of the hydrogen atom spectrum. It could not explain the ability of atom to form molecules by chemical bonds.
9. **State Pauli's exclusion principle.**
   Answer: "No two electrons in an atom can have the same set of four quantum numbers".

Five marks questions

10. **What are the results drawn from the Cathode ray discharge experiment?**
    Answer:
    (i) The Cathode rays start form cathode and move towards anode.
    (ii) Cathode rays are not visible.
    (iii) In the absence of electrical or Magnetic field, Cathode rays travel in straight lines.
    (iv) In the presence of electrical or magnetic field, the direction of deflection of cathode rays shows that they contain negatively charged particles.
    (v) The characteristics of cathode rays do not depend on the material of electrodes and nature of the gas present in the cathode ray tube.
11. **Describe Rutherford's nuclear model of the atom.**
    Answer:
    (i) The positive charge and most of the mass of the atom is concentrated in a small region called nucleus
    (ii) The nucleus is surrounded by Electrons
    (iii) The Electrons move around the nucleus in circular paths called orbits.
    (iv) The Electrons and the nucleus are held together by Electrostatic force of attraction.
12. **Write the significance of the four quantum numbers.**
    Answer:
    (i)Principal quantum number determines energy and size of the orbital
    (ii) Azimuthal quantum number defines three dimensional shape of the orbital.
    (iii) Magnetic quantum number gives the information about the spatial orientation of the orbital.
    (iv) Spin quantum number refers to orientation of the spin of the electron.