CC-IX
ELEMENTS OF MODERN PHYSICS

1 MARK QUESTIONS:

1. What is the relation between mass no. and nuclear radius?
2. What is atomic mass unit?
3. Define binding energy.
4. Define packing fraction.
5. What are magic numbers?
6. What is Schrödinger time independent wave equation?
7. What is Schrödinger time dependent wave equation?
8. What do you mean by eigen values?
9. What do you mean by eigen functions?
10. What is half-life?
11. Write the relation in between decay constant & half -life.
12. Write one example of nuclear fusion.
13. Write one example of nuclear fission.
14. What do you mean by wave-particle duality?
15. Draw a graph between photoelectric current & intensity of incident light.
16. What is stopping potential?
17. What is work function of a material?
18. Define threshold frequency of a material.
19. Find the minimum wavelength of Balmer series.
20. Find the minimum wavelength of Bracket series.

1.5MARK QUESTIONS:

1. Explain de-Broglie hypothesis.
2. What is Compton Effect?
3. What is Lyman series?
4. What is Balmer series?
5. What is Bracket series?
6. What is P-fund series?
7. Find the energy of an electron in the 3^{rd} excited state of H-atom.
8. Find the velocity of an electron in the 2^{nd} excited state of H-atom.
9. What is the change in angular momentum of an electron when it jumps from 4^{th} excited state to ground state of H-atom?
10. Write the properties of wave function.

11. What is the physical significance of wave function?
12. What is probability density?
13. What is probability current density?
14. What is Heisenberg's Uncertainty relation?
15. Write the postulates of special theory of relativity.
16. What is magnetic moment?
17. Draw the binding energy curve.
18. What do you mean by dual nature of radiation?
19. Explain the conditions for physical acceptability of wave-functions.
20. Give the normalization of wave-functions.
21. Write down Schrödinger wave equation for free particle.
22. What is nuclear force? Write the properties of nuclear force?
23. Give reasons for the non-existence of electrons in the nucleus.

2.5 MARK QUESTIONS:

1. What are the disadvantages of a linear accelerator?
2. How does Cyclotron accelerator operate?
3. State the law of radioactivity.
4. Distinguish between nuclear fission and nuclear fusion.
5. What is length contraction?
6. What is time dilation?
7. What is Ehrenfest's theorem?
8. Write the difference between Balmer series & Lyman series.
9. What is Bohr's correspondence principle?
10. Write the limitations of Bohr's theory.
11. What is the correction for finite mass of H-atom?
12. Explain the postulates of Bohr's atomic model.
13. Explain Planck's quantum theory.
14. Explain Rayleigh-Jean's theory.
15. What are the inadequacies of quantum mechanics?

5 MARK QUESTIONS:

1. What is radioactivity? State the law of radioactivity. Show that radioactivity decay is exponential in nature.
2. Explain the principle, construction and working of the cyclotron.
3. Derive Schrödinger time independent wave equation. What is the significance of wave function?
4. Derive Schrödinger time dependent wave equation. Give the properties of wave function.

5. State & explain Bohr's atomic model of H-atom. Find the expression for nth energy state of H-atom.
6. What is Compton Effect? Find the expression for Compton shift.
7. Give salient features of nuclear shell model and point out its success and failures.
8. Explain the postulates of liquid drop model. Give a simple derivation of semi empirical mass formula.