GOVT. COLLEGE FOR WOMEN PRADE GROUND JAMMU

Course Code: UPHTDSE -501 **B.Sc. Sem-V (CBCS)** **Subject: Physics**

Max. Marks: 80 **Time: 3 Hours**

Note: Candidates has to attempt all questions from sections A, B and any two questions from section C.

Section-A
(Short Answer Type)

Q1. Define Phase velocity. Obtain an expression for it. (03)

Q2. Give the interpretation of Quantum numbers *l* and *m*. (03)

Q3. Differentiate between Normal and Anomalous Zeeman effect. (03)

Q4. Explain the term Packing fraction. (03)

Q5. What are quarks. Give any two properties of quarks. (03)

Section-B
(Medium Answer Type)

Q6. What do you mean by Wave packet? Obtain an expression for the Group velocity. (07)

Q7. Solve the angular part of the Schrodinger wave equation for central field. (07)

Q8. State and explain Bohr's correspondence principle. (07)

Q9. Write a short note on (a) Nuclear Stability (b) Nuclear spin. (07)

Q10. Explain the concept of strangeness. Discuss Gell Mann and Nishizima Scheme. (07)

Section-C
(Long Answer Type)

Q11. a)What is Compton effect? Determine the expression for Compton shift. (12)

b) Calculate the Compton shift for the photon of wavelength 0.12nm undergoes Compton scattering through an angle of 90°. (03)

Q12. Derive Schrodinger wave equation in spherical polar coordinates for a central Potential field. Separate it into three independent equations. (15)

Q13. What is anomalous Zeeman effect? Discuss the quantum mechanical theory of anomalous Zeeman effect with special reference to sodium D1 and D2 lines. (15)

Q14. Define Binding energy of nucleus. Derive an expression for Weizsacker's Semi-Empirical mass formula. (15)

Q15. Discuss the principle, construction and working of a G.M. counter. Also, explain the quenching of G.M. counter. (15)