COURSE CODE-2030106

PG DEGREE EXAMINATION – JAN 2009

M.SC (PHYSICS)

QUANTUM MECHANICS

(For Candidate Admitted from Calendar 2007 Onwards)

Time: 3 Hours   **Max.Marks:75**

Section-A

Answer All the Questions: **15 X 1 = 15**

1. What is mean by free particle
2. What is mean by Schrodinger equation
3. What is Eigen value
4. What is harmonic oscillator
5. What is mean by staric effects
6. What is mean by Eigen function
7. Define angular momentum
8. What is wave function
9. What is mean by spin matrices
10. What is schrodinger picture
11. What is mean by Heisenberg picture
12. Write about Matrix mechanics
13. What is mean by perturbation theory
14. What is mean by scattering
15. What is mean by in elastic collisions

Section-B

Answer any Five Questions: **5 X 6 = 30**

16. a. Write the uncertainty relation

(Or)

b. Write about conditions on the wave equation

17. a. Explain the application of ground state of an harmonic oscillator

(Or)

b. Write about WKB approximation

18. a Write about combination of two angular moments

(Or)

b. Write about Clebsch- Gordon co efficient

19. a. Write a note on Schrodinger picture

(Or)

b. Explain Heisenberg picture

20. a. Explain harmonic perturbations

(Or)

b. Write about first order perturbation theory

Section- C

Answer any Two Questions: **2 X 15 =30**

21. Derive Schrodinger equation for a free particle
22. Explain stark effect in hydrogen
23. Explain Eiger value spectrum raising and lowering operator
24. Write about Direec's Ket and Bra vector function
25. Write about second order perturbation theory.