

SECTION C — 5 × 10 = 50 marks)

Answer ALL the questions choosing either (a) or (b).

26. (a) Discuss Kronig-Penny model for the periodic potential.

Or

(b) Deduce equation of motion in Schrodinger picture and discuss the properties of the Schrodinger picture.

27. (a) Apply variation method to H₂ molecule and discuss.

Or

(b) Calculate energy eigen value and energy eigen function for the I order time independent non-degenerate perturbation case.

28. (a) Give the theory of time dependent perturbation - I order.

Or

(b) Calculate the transition probability/unit time using time dependent perturbation theory.

29. (a) Calculate eigen values of J^2 .

Or

(b) Calculate C.G. coefficients for $j_1 = \frac{1}{2}$; $j_2 = \frac{1}{2}$.

30. (a) Obtain Dirac's equation in electromagnetic field.

Or

(b) Derive K.G. equation for H-atom.

$\psi_a + 167 \psi_b$
 $\psi_a + 167 \psi_b \rightarrow \int \psi_a \psi_b dx$
 $\psi_a + 167 \psi_b = \int \psi_a \psi_b dx$