DRAVIDIAN UNIVERSITY

DIRECTORATE OF DISTANCE EDUCATION (DDE)

KUPPAM - 517426

II Year M.Sc.(Physics) ASSISGNMENT

Paper -1 Quantum mechanics

Answer any three questions   **3x10=30**

1. Develop the theory of time dependent perturbation theory.

2. Using Born approximation, obtain the differential cross section for

scattering of electrons by a screened coulomb potential.

3. Distinguish between Schrödinger, Heisenberg and interaction

pictures in quantum dynamics

4. Obtain the eigen values and eigen values of Simple Harmonic Oscillator using

Operator Method.

5. Explain Non- degenerate Time Independent perturbation theory and find first order correction

to energy and wave function.

Paper – 2 NUCLEAR PHYSICS

Answer any three questions   **3x10=30**

1. Briefly explain Nuclear Shell Model- energy levels .

2. Explain Fermi theory of Beta decay.

3 .Explain the classification of elementary particles.

4.Give an account of powder method of crystal structure analysis.

5. Explain Mossbauer spectroscopy

Paper -3 SOLID STATE PHYSICS

Answer any three questions   **3x10=30**

1. Explain the properties of type-I, and type -II super conductors. explain the flux quantization.

2. Derive an Expression for the specific heat of solids on the basis of Debye model. How does the Debye model differs from the Einstein model.

3.Discuess the Frenkel and Schottky Imperfections.

4.Briefly explain the working principle of Electron Dispersive Microscope SEM.

5.Derive the expressions for DC and AC Josephsons currents.

Paper 4 ELECTRONICS

Answer any three questions   **3x10=30**

1. Draw and explain the optical transmitter and receiver circuit.

2. Explain I details with a neat figure the working of the internal architecture of the 8086 microprocessor.

3. With the help of a neat block diagram, explain the encoder and decoder of differential PCM system. Also obtain an expression for prediction coefficient of first order predictor.

4. What is memory addressing decoding and draw the memory map. Explain various type of memory devices.

5. Explain the different type of detection in coherent system