Roll No. .....
200 ./J./20

J-246

August - September 2010
M. Sc. (Previous) IInd Semester Examination

PHYSICS
Paper I : Quantum Mechanics - X

Time 3 Hours] [Max. Marks 35

Note : Attempt all questions. All questions carry equal marks. The blind candidates will be given 60 minutes extra time.

1. Describe WKB approximation method in detail. 7

OR

Explain Variation method and explain its application to ground state helium. 7

2. Describe Einstein's A and B Coefficients and explain Transition Probability. 7

OR

Describe wave equation for a system of charge particle. 7

3. Explain Theory of Scattering and give its physical concept, scattering amplitude and cross section. 7

OR

Explain scattering by spherically symmetric potential and discuss identical particles with spin. 7

4. State and prove Klein-Gorden equation in presence of electromagnetic field and give its application. 7

OR

Derive Dirac's relativistic equation for free electron and explain Dirac matrices. 7

5. Write short notes on any two of the following :
   (a) First order Stark effect in Hydrogen.
   (b) Absorption and Induced Emission.
   (c) Scattering by Perfectly Rigid Sphere. 7
   (d) Hyperfine Splitting.