Roll No.							

24-PH-21

M.Sc. II SEMESTER [MAIN/ATKT] EXAMINATION
JUNE - JULY 2024

PHYSICS
Paper - I
[Quantum Mechanics-II]

[Max. Marks : 75] *[Time : 3:00 Hrs.]* *[Min. Marks : 26]*

Note : Candidate should write his/her Roll Number at the prescribed space on the question paper.
Student should not write anything on question paper.
Attempt five questions. Each question carries an internal choice.
Each question carries **15 marks.**

Q. 1 Describe the Zeeman - effect in details. **(15 Marks)**

OR

What is a Variation method ? Give its application to Iroand state of Helium atom. **(15 Marks)**

Q. 2 Discuss wave equation for a system of charged particles under electromagnetic field. **(15 Marks)**

OR

What are Einstein's A and B coefficients and also describe transition probability. **(15 Marks)**

Q. 3 Describe the scattering by spherically symmetric potential. **(15 Marks)**

OR

Discuss the Born Approximation in details. **(15 Marks)**

Q. 4 Describe the probability and current density. Also give the physical significance of current density. **(15 Marks)**

OR

Obtain the Dirac's relativistic equation for free electron. What is hyperfine splitting. **(15 Marks)**

Q. 5 Write short notes on **any two** of the following - **(15 Marks)**

i) W.K.B. approximation.

ii) Absorption and induced emission.

iii) Pauli's spin matrices.

iv) Klein - Gordon equation.