This question paper contains **2** printed pages]

SA—47—2025

FACULTY OF SCIENCE AND TECHNOLOGY

B.Sc. (Second Year) (Third Semester) EXAMINATION

APRIL/MAY, 2025

(CBCS/New Pattern)

PHYSICS

Paper–VII

(Statistical Physics, Electromagnetic and Theory of Relativity)

(Thursday, 17-4-2025) **Time : 2.00 p.m. to 4.00 p.m.**

Time—2 *Hours* *Maximum Marks*—40

N.B. *:—* (*i*) Attempt *all* questions.

(*ii*) Illustrate your answer with suitable labelled diagrams wherever necessary.

1. Derive an expression for Bose-Einstein distribution law. 15

Or

(*a*) Explain entropy and thermodynamic probability and relation connecting them. 8

(*b*) A dice is thrown, what is the probability that the number obtained is a prime number. 7

P.T.O.

2. Derive an expression for electromagnetic energy and Poynting vector. 15

Or

(*a*) Obtain an expression for Einstein's energy mass relation 8

(*b*) Explain the basic postulates of Einstein's special theory of relativity. 7

3. Write short notes on (any *two*) : 10

(*a*) Probability and frequency

(*b*) Compression among B.E, F.D and M.B. [Bose-Einstein, Fermi-Dirac and Maxwell-Boltzman]

(*c*) Ampere's law

(*d*) Length contraction.