Total No. of Printed Pages: 2

SUBJECT CODE NO: YY-2369
FACULTY OF SCIENCE AND TECHNOLOGY
B. Sc. (CBCGS) (Pattern 2022) S.Y SEM - III
Examination April / May - 2024
Physics-VII Statistical Physics and Relativity

[Time: 1:30 Hours]   [Max. Marks: 40]

Please check whether you have got the right question paper.

N. B   1) All questions are compulsory.
             2) All questions carry equal marks.
             3) Draw neat diagrams & give equations wherever necessary.
             4) Figures to the right indicates full marks.
             5) Use of logarithmic table & Calculator is allowed.

Q1 Long Answer question. (Solve any one)   **10**
  A) Explain microstates & microstates.
  B) State & Explain Bose-Einstein distribution Law.

Q2 Long answer question. [solve any one]   **10**
  A) State & Explain Maxwell - Boltzmann Statistics.
  B) Explain in brief Michelson Morley Experiment.

Q3 Short answer questions/problems.
  A) If a pair of six faced dice with faces marked 1 to 6 is thrown, what is the   **5**
     probability that sum of the numbers which shown up is 8.
  B) Distinguish between Maxwell-Botzmann & Fermi-Dirac statistics   **5**
                                    OR
  A) Derive the Maxwell-Boltzmann speed distribution law.   **5**
  B) If 4 Kg of substance is fully converted to energy, how much energy is produced? **5**

Q4 Multiple Choice questions. (MCQ)   **10**
  1) The value of probability of an event cannot be
     a) Zero   b) 1
     c) $\frac{1}{2}$ d) negative

  2) Combination of 4 distinguishable objects taking three at a time are
     a) 2   b) 3
     c) 4   d) 5

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3) The thermodynamic probability of a system in equilibrium is
    a) maximum
    b) minimum but not 1
    c) 1
    d) Zero

4) According to Maxwell-Boltzmann distribution law n_i =?
    a) $g_i e^{\alpha + \beta u_i}$
    b) $g_i e^{-\alpha + \beta u_i}$
    c) $g_i e^{\alpha - \beta u_i}$
    d) $g_i e^{-\alpha - \beta u_i}$

5) Bosons obey Pauli's exclusion principle.
    a) True
    b) False
    c) Can't Say
    d) Sometimes

6) Photons obey _____ statistics.
    a) Classical
    b) F.D.
    c) M.B.
    d) B.E.

7) In how many ways two particles can be arranged in three phase cells according to B-E. Statistics.
    a) 6
    b) 9
    c) 3
    d) 27

8) According to Galilien transformation t' & t is
    a) Equal
    b) Approximately equal
    c) Not equal
    d) None of these.

9) According to Newtonian Michelson Mort Mechanics the fringe shift in the Michelson - Morley experiment is proportional to
    a) λ^2
    b) λ^{-1}
    c) λ^{-2}
    d) λ

10) According to Michelson-Morley experiment setup, a beam of light falls on a half silvered glass plate which is placed at an angle of _____ to the beam.
    a) 30°
    b) 45°
    c) 60°
    d) 90°