PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch – PHYSICS

THERMAL & STATISTICAL PHYSICS

Time: Three Hours   Maximum: 50 Marks

SECTION-A (5 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (5 x 1 = 5)

1. Find the specific heat of electricity is also known as ………
   (i) Hall effect
   (ii) Seebeck coefficient
   (iii) Peltier coefficient
   (iv) Thomson coefficient

2. Choose liquid helium is superconductor at ……
   (i) Above 2.19k
   (ii) Below 4.2k
   (iii) Below 2.19k
   (iv) Below ice point

3. Indicate thermal conduction in metals takes place by ………
   (i) Free electrons
   (ii) Bound electrons
   (iii) Vibration of molecules
   (iv) Protons

4. Identify in Carnot cycle, the first step is ……..
   (i) Isothermal expansion
   (ii) Isothermal compression
   (iii) Adiabatic expansion
   (iv) Adiabatic compression

5. Indicate the particles obeying Maxwell-Boltzmann statistics are …….
   (i) Identical
   (ii) Identical & indistinguishable
   (iii) Distinguishable
   (iv) Photons

SECTION - B (15 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks   (5 x 3 = 15)

6 a   Analyze the liquid thermometer.
                    OR
   b   Discuss the seebeck effect.

7 a   Explain Andrews experiment on CO_2.
                    OR
   b   Evaluate porous plug experiment.

8 a   Produce thermal conductivity and thermal diffusivity.
                    OR
   b   State and explain Stefan Boltzmann law.

9 a   Calculate the change in entropy when 10 grams of ice at 0° is converted into water at same temperature. (Given Latent heat of ice = 80 Cal/grams)
                    OR
   b   Find the efficiency of the Carnot's engine working between the stream point and the ice point.

10 a   State and explain Maxwell Boltzmann distribution law.
                    OR
    b   State and explain Fermi Dirac distribution law.

Cont…

SECTION -C (30 Marks)
Answer ALL questions
ALL questions carry EQUAL Marks   (5 x 6 = 30)

11 a   Compare clinical thermometer and gas thermometer.

OR

   b   Construction and working of thermoelectric thermometer.

12 a   Analyze Van der Waal's equation. Calculate the critical constants of gas.

OR

   b   Differentiate liquid helium-I and liquid helium-II.

13 a   Explain the determination of thermal conductivity of bad conductor by suitable method.

OR

   b   Discuss the experimental determination of Stefan's constant with theory.

14 a   Draw and explain the temperature-entropy diagram and also calculate the entropy of a perfect gas.

OR

   b   Derive an expression for the efficiency of a Carnot's engine.

15 a   Analyze the Maxwell Boltzmann distribution and ideal gas.

OR

   b   Evaluate the Bose Einstein distribution.

Z-Z-Z   END