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

## GA—44—2023

### FACULTY OF SCIENCE AND TECHNOLOGY

### B.Sc. (First Year) (Second Semester) EXAMINATION

### APRIL/MAY, 2023

### (New Course)

PHYSICS

Paper III

(Heat and Thermodynamics)

**(Saturday, 29-4-2023)**   **Time : 10.00 a.m. to 12.00 noon**

*Time— Two Hours*   *Maximum Marks—40*

*N.B.* :—*All* questions are compulsory.

1. Describe Joule-Thomson porous plug experiment in detail.   15

*Or*

 (*a*) Explain in detail different types of thermometers.   8

 (*b*) Derive correlation between Celsius, Kelvin, Fahrenheit and Ranking scales.   7

2. Explain in detail transport phenomena of viscosity and thermal conductivity.   15

*Or*

 (*a*) Prove the following T.ds equations :   8

  (*i*) $\quad Tds = C_p dT - T \left(\dfrac{\partial V}{\partial T}\right)_p \cdot dp$

  (*ii*) $\quad Tds = C_V dT + T \left(\dfrac{\partial P}{\partial T}\right)_V dV.$

 (*b*) Explain Carnot's heat engine.   7

<div align="right">P.T.O.</div>

3. Write short notes on any *two* (each of **5** marks) : 10

   (*a*)    Seebeck effect.

   (*b*)    Boyle Temperature

   (*c*)    Mean Free Path

   (*d*)    First Law of thermodynamics.