

Ex/SC/INSC/UG/MDC/TH/11/101E/2025

B. Sc. (INSTRUMENTATION) EXAMINATION, 2025

(1st Year, 1st Semester)

(VACUUM TECHNOLOGY)

Time : 2 Hours

Full Marks : 40

Answer *any five* questions.

1. What is saturation vapour pressure? Write down the expression of condensation flux. Draw the saturation vapour pressure of water as a function of temperature. What do you mean by partial pressure of a gas mixture? 2+2+2+2
2. What is mean free path? Write down the expression of mean free path and indicate each term used in the expression. Draw the distribution of molecular speeds at two different temperatures. 2+3+3
3. Draw the schematic diagram of sliding vane rotary pump and explain its mechanism. 8
4. What is vacuum gauge? Draw a schematic diagram of McLeod gauge and explain its working principle briefly. What is the range of McLeod gauge? 2+4+2
5. Draw a schematic diagram of thermal conductivity gauge and explain its working principle briefly. What is the range of Pirani gauge? 6+2

INSC-1025

[Turn Over]

(2)

6. What is leak and how they are classified? How to identify a leak in the vacuum system? How leak is detected with soap bubbles? 3+5
7. What do you mean by ultra-high vacuum? What are the uses of ultra-high vacuum and extreme high vacuum in science and technology? 3+5

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INSC-1025

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