



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, April 2016
(2008 Scheme)
08.805.13 : CRYOGENIC ENGINEERING (MPU)**

Time : 3 Hours

Max. Marks : 100

Instruction : *Illustrate your answers with neat sketches wherever necessary. Use of **Thermodynamic** charts and table permitted. Assume suitable data if necessary.*

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. Differentiate between Type I and Type II superconductor.
2. Arrange the following liquids according to the increasing order of their normal boiling point.

Nitrogen, Argon, Hydrogen, Helium 4 and Neon. Also mention the normal boiling point of each.
3. Differentiate among Helium I, Helium II, Helium 3 and Helium 4.
4. What is Superfluidity ?
5. Define figure of Merit of a refrigeration system.
6. What is Joule-Thomson effect ? What is its significance ?
7. Draw the schematic of a Cascaded Liquefaction system for Nitrogen.
8. What is multi-layer insulation ?
9. Write a short note on thermodynamic liquid level gauge.
10. What is a hydrostatic liquid level gauge ?



PART – B

Answer **any one** question from **each** Module.

MODULE – I

11. Explain briefly how cryogenics developed in the past years. **20**
12. Describe Ortho-Para conversion in hydrogen. Explain the importance of a Catalyst in the conversion process. **20**

MODULE – II

13. Draw the schematic and temperature-entropy diagram and explain the working of Claude liquefaction system. Also derive the expression for liquid yield. **20**
14. With a neat sketch explain the working of Simon helium liquefier. **20**

MODULE – III

15. With a neat sketch explain the working of Vuilleumier refrigerator. **20**
16. a) Explain in detail about the different safety devices used in cryogenic storage vessels. **10**
- b) Write about Vacuum insulation and Opacified power insulations used in cryogenics. **10**
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