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Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, October 2014  
(2008 Scheme)  
08.805 : CRYOGENIC ENGINEERING (MPU)**

Time : 3 Hours

Max. Marks : 100

**Instructions :** *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. What is superconductivity ?
2. What is the significance of Debye temperature in determining specific heat of solids ?
3. Draw the phase diagram for Helium 4 and explain different regions.
4. What is rolling filling phenomenon ?
5. Define figure of merit of liquefaction system.
6. What is Joule-Thomson coefficient ? What is its significance ?
7. What is the difference between Kaptiza and Heylandt Liquefaction systems ?
8. What is vapor shielding in cryogenic vessels ?
9. Write a short note on metallic resistance thermometer.
10. What are capacitance liquid level probes ?

P.T.O.



## PART - B

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

## MODULE - I

11. What are the different milestones in cryogenics ? 20
12. Describe the variation in the following properties under cryogenic condition :
- a) Thermal conductivity 6
  - b) Coefficient of thermal expansion 5
  - c) Specific heat of solids, liquids and gases. 9

## MODULE - II

13. Prove that an ideal gas would not experience a temperature change upon isenthalpic expansion. Also show the inversion curve on a PT diagram. 20
14. Draw the schematic and temperature-entropy diagram and explain the working of Linde dual pressure liquefaction system. Also derive the expression for liquid yield. 20

## MODULE - III

15. With a neat sketch explain the working of Philips refrigerator. 20
16. What are the different types of insulations used in cryogenic equipments ? 20