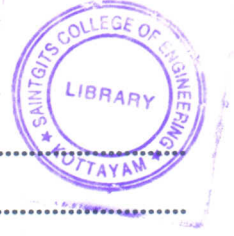


**F 3592**

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Reg. No.....

Name.....



**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

**Eighth Semester**

Branch : Mechanical Engineering

CRYOGENICS (Elective III) (M)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary—Mercy Chance]

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. Explain adiabatic magnetization.
2. Discuss the mechanical properties of materials at cryogenic temperatures.
3. Define liquefaction process.
4. Show the variation of ductility of any *two* materials as a function of temperature on a Graph.
5. Explain the difference between ortho-hydrogen and para-hydrogen.
6. Explain Gas liquefaction.
7. What do you mean by magnetic refrigeration system ?
8. Explain thermodynamically ideal isobaric-source system.
9. Explain the types of cryogenic fluid transfer systems.
10. Write short note on application of cryogenics in medicine.

(10 × 4 = 40 marks)

**Part B**

*Answer all questions.*

*Each question carries 12 marks.*

11. (a) Explain the applications of cryogenic engineering.  
*Or*  
(b) Explain isothermal and Julie Thomson expansion process
12. (a) Explain the thermal properties of materials at cryogenic temperatures.  
*Or*  
(b) Explain properties of cryogenic fluids.

Turn over

13. (a) Explain about the working of a precooled Linde-Hampson system with suitable diagram for neon and hydrogen.

*Or*

- (b) Explain Claude system of Liquefaction with T-S diagram. Derive the expressions for Liquid yield and work requirement.
14. (a) Explain Vuilleumier refrigerator with a neat schematic sketch. Draw T-S diagram for an ideal Vuilleumier refrigerator and list out its advantages.

*Or*

- (b) Explain Refrigerators using solids as working media.
15. (a) Briefly explain about the basic design parameters of cryogenic fluid storage vessels.

*Or*

- (b) Briefly discuss the types of insulations used in cryogenic systems.

(5 × 12 = 60 marks)

