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C – 2369

Reg. No. : .....

Name : .....

Eighth Semester B.Tech. Degree Examination, May 2017

(2013 Scheme)

13.805.8 : CRYOGENIC ENGINEERING (MPU)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **2** marks. **(10×2=20 Marks)**

1. Discuss the mechanical properties of materials at cryogenic temperatures.
2. Explain any one application of cryogenics.
3. What is superconductivity ?
4. Define adiabatic expansion process.
5. Draw the line diagram of Claude cascaded system.
6. Define the term Gas liquefaction.
7. Explain the difference between ortho-hydrogen and para-hydrogen.
8. What are the pay-off functions in gas liquefaction systems ?
9. Explain thermodynamically ideal isobaric-source system refrigeration.
10. What is vapour shielding in cryogenics vessels ?

PART – B

Answer **any one** full question from **each** Module. **Each** question carries **20** marks.

Module – I

11. A) Explain the term cryogenics and its development in the field of space technology. **10**

    B) Explain present areas involving cryogenic engineering. **10**

OR

12. A) Discuss the applications of cryogenics in biology and medicine. **10**

    B) Differentiate superconductivity and superfluidity. **10**

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Module – II

13. A) Explain Claude system of Liquefaction with T-S diagram. **10**

    B) Derive the expressions for liquid yield and work requirement. **10**

OR

14. A) Explain the production of low temperatures using Joule-Thomson effect. **10**

    B) Write short note on adiabatic demagnetization. **10**

Module – III

15. A) Explain refrigerators using solids as working media. **10**

    B) Discuss the working of gas liquefaction system. **10**

OR

16. A) With the help of schematic and T-S diagram, explain Philips Refrigerator. **10**

    B) Also explain briefly the importance of refrigerator effectiveness. **10**

Module – IV

17. A) Briefly explain about the basic design parameters of cryogenic fluid storage vessels. **10**

    B) Distinguish between solid, liquid and gaseous cryogenic fluids. **10**

OR

18. A) Discuss the significance of compressors, expanders and heat exchanges in a cryogenic system. **10**

    B) List the applications of Cryo pumping. **10**