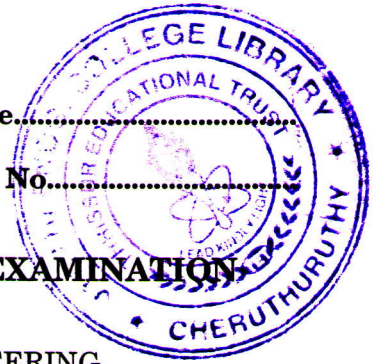


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Name.....

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**EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
APRIL 2017**

ME/PTME 09 803 L12 / AM 09 804 L11 – CRYOGENIC ENGINEERING
(2009 Admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. Brief about cryogenic temperature scale.
2. What is meant by adiabatic expansion process?
3. What are the pay-off functions in gas liquefaction systems?
4. List out *two* methods for measuring the flow rate of cryogenic liquids.
5. List out the significance of super insulations for cryogenic systems.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Discuss the various applications of cryogenics.
7. Derive the expression for minimum work required to liquefy the gasses.
8. Why simple Linde-Hampson system is not used for gases like neon, hydrogen and helium?
9. Explain the working principle of Dewar vessel for storing cryogenics.
10. Discuss the importance of vacuum insulation in cryogenics.
11. Briefly explain about Cryo pumping.

(4 × 5 = 20 marks)

Part C

Answer all questions.

12. (a) Explain the thermal properties of materials at cryogenic temperatures.

Or

- (b) Enumerate and explain the usage of cryogenic fluids in space technology applications.

13. (a) Explain Claude system of Liquefaction with T-S diagram. Derive the expressions for Liquid yield and work requirement.

Or

- (b) With the help of a neat sketch, explain the working principle of separation of Deuterium from Hydrogen.

Turn over

14. (a) Explain Joule-Thomson refrigeration system. Derive the expression for COP.

Or

- (b) Explain Refrigerators using solids as working media.

15. (a) With a help of a neat sketch explain a cryogenic liquid storage vessel.

Or

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

(4 × 10 = 40 marks)