

**D 41372**

(Pages : 2)

Name.....

Reg. No.....

**EIGHTH SEMESTER B.TECH. (ENGINEERING) [2014 SCHEME] DEGREE  
EXAMINATION, APRIL 2018**

Mechanical Engineering

ME 14 804 D—CRYOGENIC ENGINEERING

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer any eight questions.*

1. List out any *five* applications of Cryogenics.
2. Draw the T-s diagram of a cryogen.
3. Explain the following Mechanical Properties :
  - (a) Yield Strength.
  - (b) Fatigue Strength.
  - (c) Impact Strength.
  - (d) Ultimate Strength.
4. State the following Laws :
  - (a) Zeroth Law of thermodynamics.
  - (b) First Law of thermodynamics.
  - (c) Second Law of Thermodynamics.
5. Define a Thermodynamic Ideal System.
6. Determine the performance parameter of Gas Liquefaction.
7. Infer the following terms :
  - (a) Refrigerator.
  - (b) Refrigerant.
  - (c) Cryogenic fluid storage and transfer systems.
- 8 Write a short note on refrigerators using solids as working media.

**Turn over**

9. Outline some advantages and disadvantages of some Cryogenic Insulations.
10. Categorize and give a short note on the types of heat exchangers used in cryogenic systems.

(8 × 5 = 40 marks)

**Part B**

11. Paraphrase atleast five cryogenic fluids and their properties.

*Or*

12. With the help of case studies, relate the Application of Cryogenics with the following :

- (a) Food processing.
- (b) Electrical Power.

13. With the help of neat sketches illustrate, the Joule Thompson expansion and its Effect.

*Or*

14. Derive and explain the Linde-Hampson System.

15. Appraise how a cryogenic liquid can be transferred from the storage place (Transfer Systems).

*Or*

16. Summarize about the Storage systems for Cryogenic Liquids.

17. Construct the equation to determine the effectiveness of heat exchanger.

*Or*

18. Discriminate the importance of insulation. Mention and explain the different types of Cryogenic Insulations.

(4 × 15 = 60 marks)