Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME- SEMESTER II– EXAMINATION – SUMMER 2015

Subject Code: 2722110 **Date: 01/06/2015**

Subject Name: Cryogenic Engineering

Time: 2:30 PM – 5:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1(a) State the merits and Demerits of following cryogenic Insulations, along with their application:

(i) Foam Insulation

(ii) Evacuated powder and fibrous Insulation. (07)

(b) Describe Joule Thomson refrigeration effect with neat sketch (07)

Q.2(a) Define Cryogenics and also Discuss importance of Cryogenic. (07)

(b) Describe the silent features of super insulation. How all the modes of heat transfer are reduced to bare minimum for super insulation? (07)

OR

(b) Explain Superconducting motor and gyroscopes. (07)

Q.3 (a) List Cryogenic Material Properties. Explain Superconductivity with its application. (07)

(b) Explain Kapitza Liquefaction system with neat sketch. (07)

OR

Q.3 (a) With a neat diagram explain working of pulse tube refrigeration and its configuration. (07)

(b) Explain cryogenic application in Rocket propulsion systems. (07)

Q.4(a) Write short note on space simulation chamber. (07)

(b) With neat sketch explain precooled linde-Hampson Gas Liquefaction systems. (07)

OR

Q.4 (a) Discuss the application of cryogenics in food preservation and organ preservation. (07)

(b) Explain claude system for gas liquefaction system with neat sketch and T-S Diagram. (07)

Q.5(a) Explain Pulse tube cryocooler with neat sketch. (07)

(b) Explain the importance of refrigerator effectiveness for Phillips refrigerator. (07)

OR

Q.5(a) Describe thermodynamically ideal liquefaction system. (07)

(b) Discuss the various factors which govern the selection of cryogenic insulations. (07)