

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

# **GUJARAT TECHNOLOGICAL UNIVERSITY**

**M.E. SEMESTER III–EXAMINATION (Remedial)– WINTER 2015**

**Subject code: 733903**

**Date: 07/12/2015**

**Subject Name: Cryogenics Engineering**

**Time: 2:30 PM to 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) Explain different methods of production of low temperature. **07**  
(b) Write short note on criteria's of selection of cryogenic fluids. **07**

- Q.2** (a) Explain briefly the significance of cryogenics applications for space technology. **07**  
(b) Explain the concept of ortho-hydrogen and para-hydrogen. **07**  
Also Explain difference between ortho-hydrogen and para-hydrogen.

**OR**

- (b) Describe cryostats in detail. **07**

- Q.3** (a) Linde-Hampson cycle cannot be used as it is for Neon, Hydrogen and Helium. Explain. **07**  
(b) With a neat sketch explain the construction and working of space simulation chamber. **07**

**OR**

- Q.3** (a) Explain Heylandt system and its thermodynamic analysis. **07**  
(b) Explain Claude system. **07**

- Q.4** (a) Describe briefly about various commercial pressure transducers used for pressure measurements at low temperature. **07**  
(b) Explain construction and working of Magnetic Thermometer having sensing element of paramagnetic material. **07**

**OR**

- Q.4** (a) Explain in detail about Metallic resistance thermometers. **07**  
(b) Briefly describe any one cryogenic liquid level measuring device. **07**

- Q.5** (a) What are the various Safety criteria to be considered for handling of cryogens? Discuss in detail. **07**  
(b) Discuss in detail about the applications of cryogenics in food preservations. **07**

**OR**

- Q.5** (a) With a neat sketch explain the construction and working of a chemical rocket engine **07**  
(b) Explain the use of cryogenics in blood and bio-cell preservations. **07**

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