

GUJARAT TECHNOLOGICAL UNIVERSITY
ME Semester –I Examination Feb. - 2012

Subject code: 711004N**Date: 15/02/2012****Subject Name: Elements of Cryogenic Engineering****Time: 10.30 am – 01.00 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) Discuss the properties of hydrogen at low temperature. **07**
(b) Explain superfluidity of Helium and list its effects. Explain fountain effect. **07**

- Q.2** (a) Why insulation is necessary for cryogenic vessels? List the types of cryogenic insulations and write a note on Multilayer insulation. **07**
(b) Explain the effect of low temperature on thermal conductivity of the materials with neat diagram. **07**

OR

- (b) Explain the effect of low temperature on specific heat of solids. **07**

- Q.3** (a) Explain how cryogenics is useful to biological applications. Explain any one application in detail with possible diagram. **07**
(b) Explain use of cryogenics in space simulation chamber with possible neat diagram. **07**

OR

- Q.3** (a) What are the different medical applications of cryogenics? Explain how the cryosurgery is done? Also discuss its advantages. **07**
(b) What are the different types of thermometer used for low temperature? Describe working of platinum resistance thermometer with neat sketch. **07**

- Q.4** (a) Explain various types of hazards occur in cryogenics. Write a note on any one with suitable example. **07**
(b) Explain causes and precautions for accidents in cryogenic plants. **07**

OR

- Q.4** (a) What are the precautions and care to be taken for storage and handling of gaseous cylinders? **07**
(b) Write a note on Safety devices necessary for cryogenic storage vessel. **07**

- Q.5** (a) What is superconductivity? Explain meissner effect with neat sketch. Discuss effects of superconductivity on properties of materials. **07**
(b) What are the different types of liquid level measurement devices? Explain hydrostatic gauge with neat sketch. **07**

OR

- Q.5** (a) Write a note on zero friction bearing and superconducting electrical motor. **07**
(b) List the vacuum measurement devices and explain McLeod gauge with neat sketch. **07**
