Seat No.: _____

Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITYME - SEMESTER- I (New course)• REMEDIAL EXAMINATION – SUMMER 2015Subject Code: 2711001Date:13/05/2015Subject Name: CRYOGENIC FUNDAMENTASTotal Marks: 70

Instructions:

	1.	Attempt all questions.	
	2.	Make suitable assumptions wherever necessary.	
~ 1	3.	Figures to the right indicate full marks.	~-
Q.1	(a)	Analyze vacuum alone as insulation. How will you evaluate the performance of laboratory Device having vacuum alone as insulation?	07
	(b)	Discuss the variations of the following properties of material at area senio	07
	(D)	Discuss the variations of the following properties of material at cryogenic	0/
		i) Illimote strength and wield strength	
		i) Unimate strength and yield strength	
		ii) Fatigue strength	
		iii) Hardness	
		iv) ductility	
Q.2	(9)	Discuss the Application of cryogenics in superconducting devices	07
	(\mathbf{u})	In regard to specific heats of solids explain the difference between lattice	07
	(0)	specific heat and electronic specific heat.	07
		OR	
	(b)	Discuss the unusual properties of liquid helium II.	07
	()		
Q.3	(a)	Compare the following insulations with their advantages and disadvantages.	07
		1. Expanded foam 2. Gas-filled powders and fibrous materials	
		3. Opacified powder.	
	(b)	Describe briefly the salient features of MLI. Give reasons for the highest	07
		effectiveness of MLI.	
		OR	
Q.3	(a)	Explain the concept of ortho-hydrogen and para-hydrogen. Also Explain	07
		difference between ortho-hydrogen and para-hydrogen.	
	(b)	Describe the mechanism of insulation in case of each of the following and state	07
		the modes of heat transfer against which they are not effectives (i) Opacified	
		powder (ii) evacuated powder and fibrous insulation. (iii) expanded foam	
		insulations. Give their specifications.	
04	(a)	With neat sketch explain in detail about Turbine flow meters	07
V 11	(\mathbf{a})	Explain principle of working of resistance thermometer. Discuss about metallic	07
	(0)	and non-metallic resistance thermometers	07
		OR	
0.4	(a)	Explain capacitance level probe. Derive an expression for liquid level L_f and its	07
•	()	sensitivity. Discuss about the parameters affecting the sensitivity.	
04	(h)	Discuss in brief hazards on account of (i) flammability (ii) high pressure gas (iii)	07

Q.4 (b) Discuss in brief hazards on account of (i) flammability (ii) high pressure gas (iii) 07 materials of construction (iv) personal exposure hazards.

Q.5	(a)	Write note on Space simulation chamber.	07
	(b)	Describe the role of cryogenics in metal forming, improving tool life and	07
		improving the properties materials.	
		OR	
Q.5	(a)	Discuss in detail about the applications of cryogenics in food preservations.	07
	(b)	Explain the applications of cryogenics in blood preservations and biocell preservation.	07