U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

July 2023 Semester End Main Examinations

Programme: B.E. **Semester: VIII**
Branch: Institutional Elective **Duration: 3 hrs.**
Course Code: 21AE8OECAE **Max Marks: 100**
Course: Cryogenics for Aerospace Engineering **Date: 06.07.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

				CO	*PO*	Marks
			UNIT - I			
1	a)	What do you mean by cryogenics? Contrast between cryogenics and refrigeration. Also list the various properties and uses of Liquid Nitrogen		*CO1*	*PO1*	**10**
	b)	Explain with neat schematic diagram the fountain effect.		*CO1*	*PO1*	**10**
			UNIT - II			
2	a)	Explain briefly the Thrust and Velocity gain with neat sketch.		*CO2*	*PO1*	**10**
	b)	With the help of a neat schematic diagram explain the working of gas generator open cycle.		*CO2*	*PO1*	**10**
			OR			
3	a)	Briefly explain the working of staged combustion cycle (closed type) with suitable neat sketch.		*CO2*	*PO1*	**10**
	b)	With the help of neat sketches explain the working of Expander cycle.		*CO2*	*PO1*	**10**
			UNIT - III			
4	a)	Explain with neat sketch, the working of pre-cooled Linde Hampson.		*CO3*	*PO1*	**10**
	b)	Briefly explain the operation of Dual Pressure Linde Hampson method with the help of neat schematic diagram.		*CO3*	*PO1*	**10**
			UNIT - IV			
5	a)	What are cryocoolers? Classify them with a flow chart.		*CO4*	*PO1*	**10**
	b)	With the help of neat sketch, briefly describe the working of Gifford Mcmohan type of cryocoolers.		*CO4*	*PO1*	**10**
			OR			

	6	a)	What is the necessity of cryogenic insulation? list the various types of insulations used for cryogenic applications.	*CO4*	*PO1*	**10**
		b)	What is accommodation coefficient in vacuum? Also Explain Expanded foam type of insulation in cryogenics.	*CO4*	*PO1*	**10**
			UNIT – V			
	7	a)	What is the necessity of Vacuum in cryogenics technology? Also explain the flow regimes in vacuum.	*CO5*	*PO1*	**10**
		b)	Explain in detail, the construction and working of Diffusion pump with neat schematic diagram.	*CO5*	*PO1*	**10**

*****