

U.S.N.

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

Autonomous Institute Affiliated to VTU

**May / June 2025 Semester End Main Examinations****Programme: B.E.****Semester: VIII****Branch: Institutional Elective****Duration: 3 hrs.****Course Code: 22AS8OECAE****Max Marks: 100****Course: Cryogenics for Aerospace Engineering****Instructions:** Answer any FIVE full questions, choosing one full question from each unit.

<b>Important Note:</b> Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.			<b>UNIT - I</b>	<i>CO</i>	<i>PO</i>	<b>Marks</b>
	1	a)	Explain the properties and uses of Liquid Hydrogen	<i>CO1</i>	<i>PO1</i>	<b>10</b>
		b)	Explain the properties and uses of Liquid Helium	<i>CO1</i>	<i>PO1</i>	<b>05</b>
		c)	What do you mean by second sound propagation in liquid helium?	<i>CO1</i>	<i>PO1</i>	<b>05</b>
			<b>OR</b>			
	2	a)	Explain: i. Rollin film ii. Fountain effect	<i>CO1</i>	<i>PO1</i>	<b>12</b>
		b)	What are properties of Liquid oxygen, liquid Argon and liquid Neon?	<i>CO1</i>	<i>PO1</i>	<b>08</b>
			<b>UNIT - II</b>			
	3	a)	Explain the Thrust and velocity gains with the help of neat sketches	<i>CO2</i>	<i>PO1</i>	<b>10</b>
		b)	Explain Gas Generator cycle with the help of neat sketches	<i>CO2</i>	<i>PO1</i>	<b>10</b>
			<b>OR</b>			
	4	a)	Explain boil off rate in Cryogenic tank	<i>CO2</i>	<i>PO1</i>	<b>05</b>
		b)	Explain the Criteria for design of Cryogenic Engines	<i>CO2</i>	<i>PO1</i>	<b>05</b>
		c)	Explain Staged Combustion cycle with help of neat sketches	<i>CO2</i>	<i>PO1</i>	<b>10</b>
			<b>UNIT - III</b>			
	5	a)	Explain Dual pressure Linde Hampson method with help of neat Sketches.	<i>CO3</i>	<i>PO1</i>	<b>10</b>
		b)	Explain Pre-cooled Linde Hampson method with help of neat Sketches	<i>CO3</i>	<i>PO1</i>	<b>10</b>

		<b>OR</b>			
6	a)	Explain Heylandt method with help of neat Sketches.	CO3	PO1	<b>10</b>
	b)	Explain Claude method with help of neat Sketches	CO3	PO1	<b>10</b>
		<b>UNIT-IV</b>			
7	a)	Explain Gifford Mcmohan cryocooler with help of neat schematic sketches	CO4	PO1	<b>10</b>
	b)	Explain Gas filed foam and fibrous material type of insulation	CO4	PO1	<b>05</b>
	c)	Explain Vaccum type of insulation in cryogenics	CO4	PO1	<b>05</b>
		<b>OR</b>			
8	a)	Explain Stirling type cryocoolers with help of neat schematic sketches	CO4	PO1	<b>10</b>
	b)	Explain Opacified powders and Multi layer type of insulation	CO4	PO1	<b>10</b>
		<b>UNIT - V</b>			
9	a)	What is Run down time in Vaccum?	CO5	PO1	<b>05</b>
	b)	What is Pumping speed in Vaccum technology?	CO5	PO1	<b>05</b>
	c)	Explain the working of root pump with the help of neat sketches	CO5	PO1	<b>10</b>
		<b>OR</b>			
10	a)	With the help of neat sketch explain the Diffusion pump used in Vaccum technology	CO5	PO1	<b>10</b>
	b)	With the help of neat sketch explain the Turbomolecular pump used in Vaccum technology	CO5	PO1	<b>10</b>

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