Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3170515 Date:06/06/2022

Subject Name:Piping Design

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What are the general consideration while selecting piping materials?	**03**
	(b)	Explain pipe fittings.	**04**
	(c)	Explain various methods of pipe fabrication with necessary diagrams.	**07**
Q.2	**(a)**	What is water hammer?	**03**
	(b)	List various types of pumps with their applications.	**04**
	(c)	List the types of valves with their applications.	**07**
		OR	
	(c)	Hexane at 37.8°C is pumped through the system at a rate of 9.09 m^3/h. The tank is at atmospheric pressure. Pressure at the end of discharge line is 345 kPa g. The discharge is 3.05 m above the pump centre line and suction lift is 1.22 m above the level of liquid in the tank. The friction loss in suction line is 3.45 kPa and that in the discharge line is 37.9 kPa. The mechanical efficiency of the pump is 0.6.The density of the Hexane is 659 kg/m^3 and vapour pressure of the same at 37.8°C is 33.71 kPa. Calculate NPSHA and power required by centrifugal pump.	**07**
Q.3	**(a)**	Explain various types of Flanges and its applications.	**03**
	(b)	Discuss the points to be taken care during designing the pipe supports.	**04**
	(c)	Explain the factors influence the choice of pump.	**07**
		OR	
Q.3	**(a)**	Explain the function of steam separator and steam traps.	**03**
	(b)	List the special features of P and I diagram.	**04**
	(c)	Explain Lockhart and Martinelli method for calculation of pressure drop.	**07**
Q.4	**(a)**	What is (1) Schdule number (2) Cavitation (3) Pump priming?	**03**
	(b)	Discuss various supports for pipes as per ASME B 31.3.	**04**
	(c)	Draw P and I diagram for distillation column and CSTR with explanation.	**07**
		OR	
Q.4	**(a)**	List the types of flow sheet. What information are to be included in PFD?	**03**
	(b)	Discuss the types of load.	**04**
	(c)	Explain difference between PFD and P and I diagram.	**07**

Q.5	**(a)**	Explain codes and standards.	**03**
	(b)	Explain the method for deciding the wall thickness of the pipe.	**04**
	(c)	What is longitudinal and hoop stress. Derive relation between hoop stress & longitudinal stress.	**07**

OR

Q.5	**(a)**	Which steps are to be followed while selecting the pipe size?	**03**
	(b)	What is the function of gasket? Explain the selection criteria for it.	**04**
	(c)	Explain various expansion joints with their application.	**07**

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