Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER IV (NEW) – EXAMINATION – SUMMER - 2017

Subject Code: 2740806 **Date: 03/05/2017**

Subject Name: Pressure Vessel and Piping System Design

Time:02:30PM-05:00PM **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)**	Give the complete classification of stress categories for pressure vessel design.	**07**
	(b)	Discuss the procedure for computation of stress intensities in the pressure vessel.	**07**
Q.2	**(a)**	Derive the stress curvature relationship.	**07**
	(b)	Derive the equilibrium equation for a plate in Cartesian coordinate system.	**07**
		OR	
	(b)	Discuss the various boundary conditions for rectangular plates.	**07**
Q.3	**(a)**	Explain the membrane shell theory in brief.	**07**
	(b)	Derive the ASME equation for calculating the cylindrical shell thickness when subjected to internal pressure loading using membrane shell theory.	**07**
		OR	
Q.3	**(a)**	Discuss the procedure for computing the discontinuity stresses by the force method.	**07**
	(b)	Derive Lame's equation for calculating the thickness of the thick cylinder when subjected to internal pressure.	**07**
Q.4	**(a)**	Explain the procedure for designing the pressure vessel under external pressure loading condition.	**07**
	(b)	Explain the procedure for designing the stiffening ring.	**07**
		OR	
Q.4	**(a)**	Enlist the various codes of ASME for designing the pressure vessel.	**07**
	(b)	How the reinforcement area is decided at the junction of the nozzle and shell.	**07**
Q.5	**(a)**	Derive the differential equation for the deflection curve for a thin circular ring.	**07**
	(b)	Explain: Flexibility factor and stress intensification factor	**07**
		OR	
Q.5	**(a)**	State and explain the different types of pipe joints.	**07**
	(b)	Explain piping layout and piping stress analysis	**07**

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