Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III EXAMINATION – SUMMER 2015

Subject Code: 130103 **Date:27/05/2015**

Subject Name: Analysis of Mechanism and Machine Elements

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)**	Classify different types of riveted joint. Explain Caulking and Fullering.	**07**
	(b)	With help of neat sketches explain inversions of four-bar mechanism.	**07**
Q.2	**(a)**	With help of neat sketch explain Withworth quick return mechanism.	**07**
	(b)	Define I-center and explain Kennedy's theorem.	**07**
		OR	
	(b)	Differentiate between mechanism and machines. And define rigid body and resistant body.	**07**
Q.3	**(a)**	State Alembert's principle. How it helps in solving dynamic analysis problem?	**07**
	(b)	What do you mean by piston effort and crank effort? Give their expression as per usual notations.	**07**
		OR	
Q.3	**(a)**	Enlist different types of welding processes and explain any one.	**07**
	(b)	A double riveted double cover butt joint in plates 20 mm thick is made with 25 mm diameter rivets at 100 mm pitch , The permissible stresses are σ_t = 120 MPa, σ_c = 150 MPa and τ = 100 MPa. Find the efficiency of the joint, taking the strength of the rivet in double shear as twice than that of single factor.	**07**
Q.4	**(a)**	Find the thickness for a tube of internal diameter 100 mm subjected to an internal pressure which is 5/8 of the value of the maximum permissible circumferential stress. Also find the increase in internal diameter of such a tube when the internal pressure is 90 N/mm^2. Take E = 205 kN/mm^2 and μ = 0.29. Neglect longitudinal strain.	**07**
	(b)	Define pressure vessel and explain its classification in details.	**07**
		OR	
Q.4	**(a)**	A solid circular shaft is subjected to a bending moment of 3000 N-m a torque of 10000 N-m. The shaft is made of 45C8 steel having ultimate tensile stresses of 700 MPa and an ultimate shear stress of 500 MPa. Assuming a factor of safety as 6, determine the diameter of shaft.	**07**
	(b)	How the shaft is designed when it is subjected to twisting moments only?	**07**
Q.5	**(a)**	In a four bar chain ABCD, AD link is fixed and is 120 mm long. The crank AB is 60 mm long and rotates at 120 rpm in clockwise direction, while the link CD = 70 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°.	**07**
	(b)	Explain Klein's construction for slider cranks mechanism	**07**

OR

Q.5	**(a)**	In a four bar chain ABCD, AD link is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 10 rad/sec in clockwise direction, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°.	**07**
	(b)	What do you understand by torsional rigidity and lateral rigidity?	**07**

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