Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–V • EXAMINATION – WINTER 2013

Subject Code: X 51903 **Date: 09-12-2013**

Subject Name: Machine Design-I

Time: 10.30 AM - 01.00 PM **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)**	Write a brief note on "Preferred numbers".	**07**
	(b)	Describe the Fatigue failure models in detail.	**07**
Q.2	**(a)**	Design the Double shoe pivoted brake.	**07**
	(b)	A thin cylinder pressure vessel of 500 mm diameter is subjected to an internal pressure of 2 N/mm^2. If the vessel thickness is 20 mm, find the Hoop stress, Longitudinal stress & Max. Shear stress.	**07**
		OR	
	(b)	Enumerate the creation of Modified Goodman Diagram.	**07**
Q.3	**(a)**	Describe the various Spring Materials.	**07**
	(b)	Write a note on Notch sensitivity with suitable example.	**07**
		OR	
Q.3	**(a)**	Describe the Leaf springs.	**07**
	(b)	A Helical Spring is made of wire of 6 mm. dia. & has outside dia. of 75 mm. If the permissible shear stress is 350 MPa & modulus of rigidity 84 KN/mm^2, find the axial load which the spring can carry & deflection per active turn.	**07**
Q.4	**(a)**	Describe the various types of Gaskets.	**07**
	(b)	Describe the various types of Chains.	**07**
		OR	
Q.4	**(a)**	Give the note in detail- Designation of Wire Rope.	**07**
	(b)	Derive the equation for length of Crossed belt drive.	**07**
Q.5	**(a)**	Enumerate the various Lubricants used in Bearing.	**07**
	(b)	Classify the different types of Clutches & Brakes.	**07**
		OR	
Q.5	**(a)**	Write the Different types of Ball Bearing.	**07**
	(b)	A 80 mm long Journal bearing supports a load of 2800 N on a 50 mm dia. shaft. The bearing has a radial clearance of 0.05 mm & viscosity of oil is 0.021 kg / m-s at the operating temp. If the bearing is capable of dissipating 80 J/s, determine the Maximum safe speed.	**07**

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