

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/mm². 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/mm², 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**
