

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME Semester –II Examination Dec. - 2011**

**Subject code: 1721502**

**Date: 12/12/2011**

**Subject Name: Behaviour of Reinforced Concrete**

**Time: 02.30 pm – 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.**

- Q.1** (a) State the differences between stress-strain model of concrete adopted by ACI-318 and IS-456. **07**  
(b) Explain mechanism to resist flexural load acting up to failure of a reinforced concrete beam. **07**

- Q.2** (a) Which measures are specified to prevent the brittle failure of the beam in flexure? Explain the assumptions made in flexure theory. **07**  
(b) Discuss: The effective width of flange of a T- beam in a simply supported beam and cantilever beam. **07**

**OR**

- (b) How does an increase in tension steel improve shear capacity of a concrete beam? State the parameters that affect their shear behavior. **07**

- Q.3** (a) State the two methods of determining the ultimate load capacity of slabs and explain the significance of yield line theory. **06**  
(b) Derive 'm' for the orthotropically reinforced rectangular slab, simply supported all around and uniformly loaded. **08**

**OR**

- Q.3** (a) Define poisson's ratio, modulus of elasticity, and modulus of rupture and explain their influence on the behavior of reinforced concrete elements. **06**  
(b) The role of web reinforcement in torsion members is similar to that of stirrups in flexural members subject to shear. Justify the statement. State the provisions from the code. **08**

- Q.4** Discuss the following **14**  
(i) effect of temperature on concrete  
(ii) braced and unbraced columns  
(iii) active and passive confinement  
(iv) factors affecting long term deflection

**OR**

- Q.4** A short eccentrically loaded column has uniaxial bending. Discuss the modes of failure in combined axial load and uniaxial bending in context of their strain diagram and location of neutral axis. **14**

- Q.5** (a) Determine the maximum short and long term deflection under dead load **14**

and live load for a R.C.C cantilever beam of rectangular section 225mm by 450mm overall depth . The effective span of beam is 2.5m .The beam is reinforced with 3 bars of 20mm at an effective depth of 400 mm. Take self weight plus dead weight as 3kN/m and service load as 7.5kN/m .Use M20 grade concrete and Fe-415.

**OR**

- Q.5** (a) Sketch neatly the trajectories of principal stresses in a homogenous isotropic beam and explain their significance. **07**
- (b) Why is design bond strength for concrete increased for compression bars and deformed bars? What are the factors influencing the stress transfer mechanism of bond .? **07**

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