

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1721502****Date: 09/07/2012****Subject Name: Behavior of Reinforced Concrete****Time: 10:30 am – 13:00 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) Explain various design philosophies for reinforced concrete in detail. **06**
 (b) Describe stress-strain characteristic curve of unconfined concrete prescribed by various researchers. **08**

- Q.2** (a) How does the confinement affects the compressive strength of concrete? Explain in detail taking example of reinforced column. **07**
 (b) Describe effect of uniaxial and biaxial stresses on concrete. **07**

OR

- (b) State and explain the significance of assumptions made in limit state of flexure and limit state of compression. **07**
- Q.3** (a) Explain the mechanism to resist applied moment by a reinforced concrete beam. **08**
 (b) Answer in short: **06**
 (i) What is the need to provide minimum longitudinal reinforcement in concrete beam?
 (ii) In a continuous beam cast in-situ with top slab, maximum moment resisting capacity of section shall be at mid span and minimum shall be supports. Why?
 (iii) Ductility of singly reinforced concrete section is higher than balanced section. Explain.

OR

- Q.3** Explain the mechanism to resist shear force by a reinforced concrete beam with and without shear reinforcement. Also describe factors affecting shear strength of reinforced concrete section. **14**

- Q.4** (a) What do you understand by development length? What is its significance? **02**
 (b) How the bond stresses develop at the surface of reinforcement? What are the factors affecting bond strength? Explain in detail. **06**
 (c) Give load resisting mechanism of corbel in brief. **06**

OR

- Q.4** (a) Give various steps involved in calculating long term and short term deflection of (i) One way slab (ii) Doubly reinforced beam **06**
 (b) Analyze a triangular slab with all sides simply supported using yield line theory. **08**

- Q.5** (a) How a torsional moment arises in reinforced concrete structure? Explain three such examples through free hand sketches. **04**
 (b) Describe in brief: **10**
 (i) Why do we need to put side face reinforcement in a reinforced concrete beam?
 (ii) Why torsional reinforcement cannot have more than two legs?
 (iii) Why it is necessary to provide longitudinal as well as shear reinforcement for section under torsional moment?
 (iv) Draw bending stress, shear stress and torsional stress distribution diagram across a rectangular section.

OR

- Q.5** Write a short note on following (Attempt any four): **14**
 (a) RC element under biaxial moments
 (b) Interface shear transfer
 (c) Combined shear and torsion
 (d) Effective section in torsion
 (e) Factors affecting long term deflection
 (f) Effect of slenderness in column

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