

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E Sem-II Remedial Examination December 2010****Subject code: 721502****Subject Name: Behaviour of Reinforced Concrete****Date: 20 /12 /2010****Time: 02.30 pm – 05.00 pm****Total Marks: 60****Instructions:**

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

- Q.1** (a) Discuss the various stress-strain models for concrete proposed by researchers. **06**
(b) Explain the concept of nominal flexural strength of a beam and codal provisions to prevent brittle failure of beam in flexure. **06**

- Q.2** (a) Discuss the response of RC elements under biaxial bending. **06**
(b) When can the T-beam action be justified in the design process? State the measures taken to ensure that in the usual construction practice the slabs and beams in a frame structure act as monolithic. **06**

OR

- (b) Clarify why shear design is considered as limit state of collapse? Explain how does a concrete beam resist shear? **06**
- Q.3** (a) Justify the statement giving example: Yield line theory is the simplest approach that the designer can use and it represents the true behaviour of reinforced concrete slabs **04**
(b) Derive 'm' for the isotropically reinforced circular slab, simply supported all around and uniformly loaded. **08**

OR

- Q.3** (a) Sketch neatly the trajectories of principal stresses in a homogenous isotropic beam **04**
(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** Explain the significance of any three **12**
(i) effect of slenderness ratio and radius of gyration
(ii) beam with very small amount of steel
(iii) confinement effect
(iv) moment curvature relationship

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. **12**
- Q.5** (a) A rectangular cantilever beam of 3m span is 300 mm wide and 600 mm deep, and is reinforced with 3 bars of 25 mm at tension side, placed at an effective cover of 50 mm. It is subjected to a maximum bending moment of 125 kN-m at the fixed end, out of which 50% is due to permanent loads. Check the beam for deflection. Assume M20 concrete and Fe 415 steel. **12**

OR

- Q.5** (a) State the precautions taken and measures practiced to reduce deflection. What are the limits of deflection of a structure or a structural member as given by the code of practice? **06**
(b) What is a local bond and Why is it called flexure bond? What are the factors influencing the stress transfer mechanism of bond? **06**
