

Registration No:

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

Total Number of Pages : 1

M.TECH

M.TECH 2<sup>ND</sup> SEMESTER (AR 17) SUPPLEMENTARY EXAMINATIONS, APRIL/MAY 2019

ADVANCED REINFORCED CONCRETE DESIGN

Branch: SE, Subject Code:MSEPC2010

Time: 3 Hours

Max Marks : 70

**PART-A**

(10 X 2=20 MARKS)

**1. Answer the following questions.**

- State the essential difference between limit state and working stress design philosophies.
- Show with the help of a diagram the major and minor axes of a column section.
- Why is it necessary to limit deflections in RC flexural members?
- What is the necessity of providing cover in the reinforcement?
- What are positive and negative yield lines?
- What is the difference between limit state of collapse and limit state of serviceability?
- What are the various factors that effects deflection?
- What is the purpose of taking minimum eccentricities in column design?
- Showing the curtailment and also bent up bars, draw the reinforcement detailing of a continuous beam.
- What do you mean by shear span?

**PART-B**

(5 X 10=50 MARKS)

**Answer any five questions from the following.**

- Design a simply supported isotropically reinforced square slab of side 3.0m to carry a service load  $3.5 \text{ kN/m}^2$ . Use yield line theory, M20 concrete and Fe415 steel. [5]
  - Draw reinforcement details as per codal requirements. [5]
- How is the short term deflection due to live loads alone estimated? What is its relevance? [5]
  - Explain clearly the difference in behavior of one way and two way slabs. [5]
- A simply supported beam is of effective span 4.0 m. whose depth is limited to 350mm. the live load on the beam is 20 kN/m. there is one concentrated load of 20 kN at mid span. Design the flexural reinforcements taking M25 concrete and Fe415 steel with mild exposure conditions. [5]
  - Perform check as usual for the above beam. [5]
- Describe the types of sub frames for the analysis of beams and columns. [5]
  - Determine the minimum thickness of flat plate having edge beams with 7.5 x 6 m panels on 500 mm square columns. Assume 415 grade steel. [5]
- Describe the effect of minimum stiffness of columns. [5]
  - Find suitable dimension of simply supported slab of span 6.5 to be made from structural hollow clay blocks 300 x 300 x 250mm height with 20mm wall thickness. Determine the reinforcements required if the slab is to carry an imposed load of  $4.0 \text{ kN/m}^2$ . [5]
- Describe the modified stiffness method for longitudinal distribution of  $M_o$  in end span. [5]
  - Explain two way punching shear with different cases. [5]
- Write short notes on [5]
  - Shear due to unbalanced moment [5]
  - Design procedure for ties