

TCE-501

43

Printed Pages : 4

Roll No. to be filled in your Answer Book

Roll No.

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B.Tech

(Sem V) (ODD Sem. Examination 2014)

Design of RC Element

Paper ID:-410021

Time : Three Hours]

[Max. Marks : 100

- Note:**
- (i) Attempt ALL questions.
 - (ii) All Questions carry EQUAL marks.
 - (iii) In case of numerical problems assume data whenever not provided.
 - (iv) Don't write any thing on the question paper except your roll no.

Q.1. Attempt any FOUR of the following : 5x4=20

- a) What do understand by compressive strength and tensile strength of concrete?
- b) Explain the characteristic strength of concrete.
- c) Draw the stress strain diagram of concrete and describe it.
- d) What do understand by the modular ratio of concrete and creep?
- e) Write short note on working stress method and why we use limit state method?

(1)

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- f) Compare the working stress method and limit state method.

Q.2. Attempt any FOUR of the following : 5X4=20

- a) A rectangular beam of size 400X750mm is to be designed for a Bending moment

i) 150 kNm

ii) 320kNm

Using M20 concrete and Fe 415 steel. Design the beam calculates the area of steel required and Moment of resistance for balanced section. Use WSM.

- b) A rectangular beam of size 300X65mm overall depth is provided for simply supported span of 6m subjected to live load 25 kNm excluding self weight. Find out stress developed in steel and concrete if modular ratio $m=11$. Area of steel 5 bars of 25mm. Use WSM.

- c) Calculate the moment of resistance of rectangular beam of size of 400X600mm overall depth. Area of steel provided 6-25mm dia bars. Calculate A_{st} required for balanced section use M25 concrete and Fe415 steel. Use WSM.

Q.3. Attempt any TWO of the following : 10x2=20

- a) A doubly reinforced beam is used for simply supported effective span of 7m and is subjected to a live load 'of 30KN/m excluding the self wt. Effective cover: 50mm. calculate the stress developed in beam if $m=11$ Use WSM.

- b) Design a rectangular beam for a span of 8m simply supported subjected to live load of 40KN/m excluding self wt. If the size of beam is to be restricted to 500X700mm overall depth use M25 concrete Fe500 steel. Consider effective cover 50mm Use WSM.
- c) If a beam of size 300X500mm is provided 2-25mm dia bars and supported over simply supported span of 7m and subjected to total load of 25KN/m check for bound use M20 and Fe415 Use LSM.

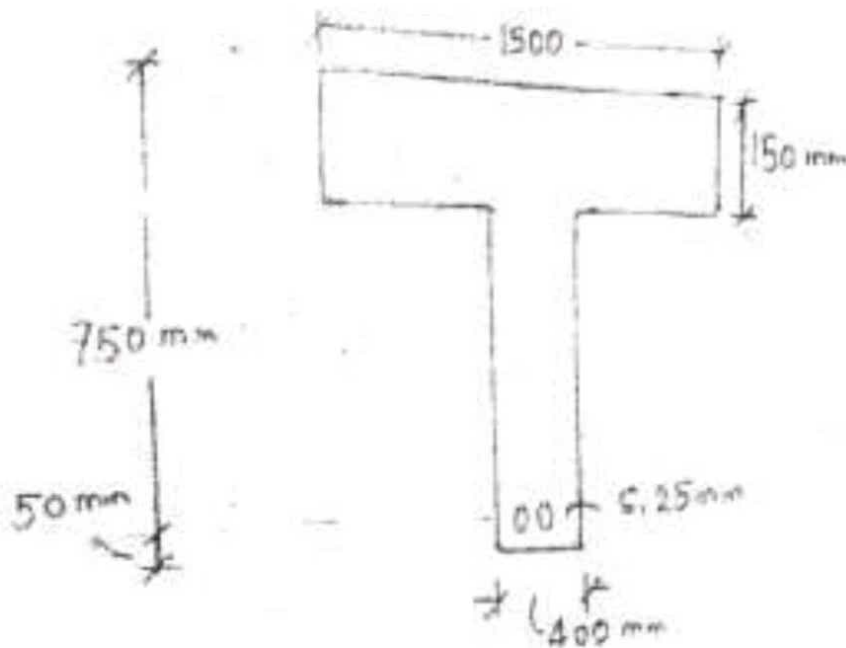
Q.4. Attempt any TWO of the following : 10x2=20

- a) If a beam is to be designed for simply supported span of 6m subjected to a live load of 20KN/m. size of beam is 300X600mm calculate the area of steel required when M25 and Fe415 steel is used effective cover of 50mm (Use LSM).
- b) A simply supported beam of 4.5m effective span is carrying 30KN/m. The size of the beam is to be restricted to 300X380mm overall depth. Design the beam for bending using M20 concrete and Fe415 steel design coefficient $K=0.138$, $j=0.8$, $K_u=0.479$ (Use LSM).
- c) Write the design steps for one way slab.

Q.5. Attempt any TWO of the following : 10x2=20

- a) A reinforcement concrete column of size 500X600mm having an effective length of 3.6m is to be designed using limit state method to support an axial service load of 300KN. Use M20 and Fe415 HYSD bars.

- b) Calculate the moment of resistance of T-beam simply supported over the span of 7m. Beam width of flange 1500mm, thickness of flange 150mm, width of web 400mm, effective depth of 750mm and effective cover 50mm use M30 & Fe415 by WSM.



- c) Write the design step of doubly reinforcement beam.

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