制造的 计数据证明

Community of the state of the s TO SERVICE STRUCK STRUCK SHOW AND THE RESERVED A PROPERTY OF THE

THE PROPERTY OF THE PROPERTY O

December of the explosion seed of their gold and A 1996 the and the recommendence

1. 高级技术

44.5

HARAN AL NOVER

regions is experience, who red is the employer is increased in

garana and Inned Like

Western State of the State of t

agraphed fixed that the set is a stage of the

this other was an box or one at the Mainter in head given a green of gotten and their and कार्य है जिले. असे कार्य के असे कार कार्य कार्य के की की कार्य के की

Reg. No. :		 .,	l	 		100	16.0
iteg. 140						¥ 1	

0/0

Question Paper Code: 50287

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017 Fifth Semester

Civil Engineering CE 6505 - DESIGN OF REINFORCED CONCRETE ELEMENTS (Regulations 2013) sa Walaawii Lu

Maximum: 100 Marks Time: Three Hours

> material of a significant (s. 11) Use of IS 456 is Permitted. Adopt grade of concrete M25 and Fe415 steel wherever required. Answer ALL questions.

> > PART - A

 $(10\times2=20 \text{ Marks})$

applied by Mal

and the first of the control of the second of the control of the c

- 1. Draw stress strain diagrams for a beam for elastic method, Ultimate Load method and Limit State method (LSD).
- 2. What are the philosophy of limit state method? The state of the philosophy of limit state method? The state of the philosophy of limit state method?
- 3. What are the minimum and maximum reinforcement for a beam in LSD?
- 4. Distinguish between the behavior of one way slab and two way slab.
- 5. Determine the anchorage length for 20mm diameter bar.
- 6. What is torsional shear? A and a real date and was to me a Character of a whole (if

141

7. What is the need of minimum eccentricity clause for a column design?

The real particles who has the training of the particular states in the particular states and the particular states and the particular states are states and the particular states are states as the particular states are states are states as the particular states are states are states as the particular states are states are states as the particular states are states as the particular states are states as the particular states are states

- 8. What is meant by braced column?
- 9. What are forces to be considered while designing the footing?
- 10. When do you prefer combined footing?

PART - B

 $(5\times13=65 \text{ Marks})$

11. a) Design a simply supported reinforced concrete beam to carry a bending moment of 50 kNm as doubly reinforced section by working stress design. Keep the width is equal to half the effective depth.

(OR)

- b) Design a simply supported rectangular slab for a hall of size $4 \text{ m} \times 5 \text{ m}$ to carry a UDL of 5 kN/m^2 .
- 12. a) Calculate ultimate moment of resistance of the beam of size 300 mm × 500 mm provided with tensile reinforcement of 9000 mm² and compression reinforcement of 3000 mm². Take the effective cover at top and bottom is 40 mm. (13)

(OR)

- b) Design the reinforcement for a T-beam for the following data:

 Effective span: 8m

 Spacing of beams = 3m, Thickness of slab = 130 mm

 Total depth = 450 mm, Live load = 10kN/m²
- 13. a) Design the shear reinforcement for a beam 150 mm \times 300 mm effective depth subjected to 15 kN/m. the span of the beam is 5 m. Take tensile reinforcement at a section is 1.2%. (13)

(OR)

- b) Design the reinforcement required for the section 300 mm \times 500 mm for the following data :
 - Bending moment = 65 kNm, Torsional moment = 40 kNm, Shear force = 70 kN. (13)
- 14. a) Design a short column to carry an axial load of 1200 kN and moment of 60 kNm about the major axis. The effective height of column is 3 m. (13)

(OR)

b) Design the reinforcement for a column of size 250 mm × 300 mm if it is subjected Pu = 500 kN, Mux = 50 kNm and Muy = 30 kNm. Provide effective cover of 50 mm.

15. a) Design a rectangular footing for a column 400 mm × 400 mm to transfer an axial load of 1000 kN. The safe bearing capacity of soil is 150 kN/m². (13)

(OR)

b) Design a combined footing for two columns $300 \text{ mm} \times 300 \text{ mm}$, 4m apart to transfer an axial load of 1500 kN each. The width is restricted to 2.5 m. The safe bearing capacity of soil is 200 kN/m^2 .

PART - C

(1×15=15 Marks)

- 16. a) Explain in detail about the following methods of design.
 - i) Elastic method
 - ii) Ultimate load method
 - iii) Unit State Method.Also explain their merits and demerits.

(OR)

b) Design a footing to carry a strip load of 100 kN/m transferred by a wall of width 0.5 m. Safe bearing capacity of the soil is $150 \, \text{kN/m}^2$.