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B.E/ B.Tech (Full Time) ARREAR EXAMINATION, NOV./DEC 2012

CIVIL ENGINEERING

SIXTH SEMESTER

CE 9353 – DESIGN OF REINFORCED CEMENT CONCRETE AND MASONRY STRUCTURES {Regulation-2008}

Time: 3 hours Max: 100 marks

Instructions: 1. Answer ALL questions

2. Necessary codes, tables and charts will be supplied

3. Missing data may suitably be assumed

PART – A (10 x 2 = 20 marks)

1. What are the objectives of design of reinforced concrete structures?
2. Give four reasons to justify the design of structures by limit state method.
3. Under what circumstances are doubly reinforced beams used in practice?
4. Why do we consider most of the beams as T and L- beams between supports and rectangular beams over the support of continuous span?
5. State the minimum amounts of reinforcing bars to be provided in slabs.
6. Mention the provisions of torsional reinforcing bars in restrained type of two way slabs.
7. What are the minimum numbers of longitudinal bars in rectangular and circular columns?
8. What are the factors influencing the thickness of an isolated column footing?
9. How the permissible stress on masonry is calculated?
10. How do you determine the slenderness ratio of a masonry wall?

PART – B (5 x 16 = 80 marks)

11. Determine the safe axial load per metre length of a solid brick masonry wall of 230mm thick. The height of the wall is 3.4 m. The wall is continuous at both ends between the cross walls of spacing 6 m. M1 mortar and bricks of compressive strength 7.5 MPa are used.
12. (a) A reinforced concrete rectangular beam of 250mm width and 500mm total depth is reinforced with four numbers of 16mm diameter reinforcing bars. Determine the moment of resistance of the section and the stresses in tensile reinforcement and extreme concrete compression fibre by the working stress method. Assume moderate exposure condition for cover requirement. The materials are M25 concrete and Fe 415 steel.

(Or)

(b) Briefly describe the design procedures for the design of reinforced concrete structures by Working stress method, Ultimate load method and Limit state method. Mention the merits and demerits of each method.

13. (a) A T-beam has effective flange width 1800 mm, flange thickness 120 mm, web width 230 mm and effective depth 520 mm. Determine the ultimate moment of resistance of the section ,if it is reinforced with 4 numbers of 25 mm diameter Fe 415 steel bars. Concrete of grade M20 is used.

(Or)

(b) Determine the reinforcement required for a R.C rectangular beam 300 mm wide and 500 mm effective depth subjected to a factored bending moment of 100 kNm , a factored torsion moment of 50 kNm and a factored shear force of 80 KN. Use concrete of grade M20 and steel of grade Fe415.

14 (a) Design the floor slab of a hall of size 3.3 m x 8 m. The slab is simply resting on 230 mm brick wall on all four sides and subjected to a live load of 4.5 kPa and a finish load of 1 kPa. Adopt limit state method of design and sketch the reinforcement details. Concrete of grade M20 and steel of grade Fe 415 are used.

(Or)

(b) A simply supported slab for a room of size 4 m x 4 m is resting on 230 mm thick masonry walls on all four sides. Design the slab by limit state method. Assume the live load on the slab as 3 $kN/m^2$ and finish load as 1.5 $kN/m^2$ . Concrete of grade M20 and steel of grade Fe 415 are used.

15. (a) Design the reinforcement required for a short reinforced concrete column of size 400 mm x 600 mm subjected to a factored load of 1100 kN at an eccentricity of 100 mm about the major axis. Assume a clear cover of 50 mm. Concrete of grade M25 concrete and steel of grade Fe415 are used.

(Or)

(b) Design a reinforced concrete footing for a concrete wall of 200 mm thick to support a working load of 250 kN/m. Safe bearing capacity of the soil may be taken as 160 kPa. Concrete of grade M25 concrete and HYSD steel of grade Fe415 are used.