Total No. of printed pages = 2

CT-504/D of RCC Struc/5th Sem/2013/M

DESIGN OF RCC STRUCTURES

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

1. A doubly reinforced concrete beam having a rectangular section 250 mm wide, overall depth 500 mm is reinforced with 2 bars of 12 mmϕ in compression side and 4 bars of 20 mmϕ in tension side. The effective cover to both bars being 40 mm. If M20 grade concrete MS bars are used, then estimate the ultimate moment of the section and also calculate the safe working moment. 14

2. (a) Why steel is considered as a most suitable reinforcing material with concrete ? 6

   (b) Mention the types of steel used as reinforcement in concrete. Expand the term HYSD. 2

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(c) What is meant by serviceability, safety and economy associated with design of RCC structures. 6

3. List out the whole procedure for finding out moment of resistance for a balanced section. 14

4. Differentiate between : $4 \times 3 \cdot 5 = 14$

(i) Short columns and long columns

(ii) One way slab and two way slabs

(iii) PCC and RCC

(iv) LSM and WSM.

5. A reinforced beam of rectangular section 300 mm wide and 730 deep is reinforced with 4 bars of 25 mmϕ at an effective depth of 685 mm. The effective span of beam is 7m. If f_{ck} is 20 Mpa, and $f_y = 415$ Mpa, find the safe allowable working live load on the beam. 14