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09ENG5.5

Fifth Semester B.Arch. Degree Examination, Dec.2016/Jan.2017
Structures - V

Time: 3 hrs. Max. Marks:100

Note : 1. ***Answer any FIVE full questions.***
2. ***Use of IS456 & SP-16 is permitted.***
3. ***Any missing data may be assumed suitably.***

1 a. Explain the importance of W/C ratio. **(06 Marks)**
b. Define Workability. What are the factors affecting workability? **(07 Marks)**
c. List the advantages and disadvantages of R.C.C over other materials. **(07 Marks)**

2 a. What are the assumptions made in working stress method? **(06 Marks)**
b. A rectangular beam of size 230mm × 600mm over all depth is reinforced with 4 no. 12mm diameter bars. Find the safe uniformly distributed load on the beam in addition to its self weight on a span of 4m. The materials are M20 grade concrete and Fe 415 steel. **(14 Marks)**

3 a. Explain the philosophy of limit state method of design. **(06 Marks)**
b. Determine the factored moment of resistance of a beam section 230mm × 460mm effective depth reinforced with 2-16mm diameter bars as compression reinforced at an effective cover of 40mm and 4-20mm diameter bars as tension reinforcement. The materials are M-20 grade concrete and Fe – 415 steel. **(14 Marks)**

4 a. Briefly explain the procedure to find the effective breadth of the flange in case of a T-beam as per IS 456-200. **(04 Marks)**
b. Design a simply supported beam of 6m span carries a characteristic load of 24KN/m inclusive of its self – weight. The beam section is 230mm × 600mm. The materials are M-20 grade concrete and Fe-415 steel. **(16 Marks)**

5 Design a one way slab of clear span 3.0m × 8.0m supported on beams 350mm thick to carry live load of 2kN/m^2 and floor finish of 1kN/m^2. Use M-20 and Fe-415. Draw neat sketches. **(20 Marks)**

6 a. Explain the design specifications in compression member as per code. **(06 Marks)**
b. Design a rectangular column of size 300mm × 600mm subjected to a load of 1200kN and an axial moment of 200kN-m. Use M-20 concrete and Fe-500 steel. **(14 Marks)**

7 Design a square isolated footing for a column of size 300mm × 300mm subjected to a load of (service load) of 330 kN. The SBC of soil is 360 kN/m^2. Use M-20 grade concrete and Fe – 415. Draw neat reinforcement details. **(20 Marks)**

8 Design a 2-way slab for a room 4.3m × 6.5m in dimensions. It is supported on 300 thick walls on all four sides. The L.L is 3kN/m^2 and floor finish is 1.0 kN/m^2. Use M-20 grade and Fe – 415 steel. Edges are simply supported and corners are not held down. **(20 Marks)**

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