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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