

CRASH COURSE

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09ENG5.5

Fifth Semester B.Arch. Degree Examination, May 2017

Structures – V

Time: 3 hrs.

Max. Marks:100

Note:1. Answer any FIVE full questions.

2. Use of IS456 and SP16 is permitted.

3. Missing data may be suitably assumed.

- 1 a. What is meant by workability of concrete? Explain any one method of determining workability of concrete. (08 Marks)
b. Discuss the different types, sizes and grades of reinforced steel used in RCC. (06 Marks)
c. Explain the objectives of concrete mix design. List the parameters, which influence the mix design. (06 Marks)
- 2 a. What are the assumptions made in working stress method? (04 Marks)
b. Explain balanced, under reinforced and over reinforced sections in analysis of RCC. (06 Marks)
c. A singly reinforced concrete beam with an effective span of 4 m has a rectangular section with a width of 250 mm and an overall depth of 550 mm. The beam is reinforced with 3 bars of 10 mm diameter Fe415 HYSD bars at an effective depth of 500 mm. The self weight of beam together with the dead load is 4 kN/m. Calculate the maximum permissible live load on beam. Assume M20 grade concrete. (10 Marks)
- 3 a. Define shrinkage. What are the factors influencing shrinkage? (08 Marks)
b. List the advantages and disadvantages of Reinforced cement concrete. (06 Marks)
c. Explain water cement ratio and how it affects the strength of concrete. (06 Marks)
- 4 a. Explain the philosophy of limit state method of design. (06 Marks)
b. Design a singly reinforced concrete beam of clear span 3 m to support a working live load of 6 kN/m. Width of support is 200 mm. Adopt M₂₀ grade concrete and Fe415 grade HYSD bars. Adopt limit state method. (14 Marks)
- 5 Design a reinforced concrete beam of rectangular section using following data:
Effective Span = 8 m ; Width of beam = 300 mm; Overall depth = 650 mm
Working live load = 30 KN/m; Effective cover = 50 mm;
Materials : M20 grade concrete and Fe 415 HYSD bars. (20 Marks)
- 6 a. Differentiate between one way slab and two way slab. (04 Marks)
b. Design a simply supported RCC slab for an office floor having clear dimensions of 4 m by 10 m with 230 walls all around to carry live load of 4 kN/m². Adopt M₂₀ grade concrete and Fe415 grade HYSD bars. (16 Marks)
- 7 a. Write the classification of columns in detail. (06 Marks)
b. Distinguish between long and short columns. (04 Marks)
c. Design the reinforcement in a column of size 400 mm by 600 mm subjected to an axial working load of 2000 KN. The column has an unsupported length of 3 m and is braced against side sway in both directions. Adopt M20 grade concrete and Fe415 HYSD bars. (10 Marks)
- 8 Design one of the flights of a dog legged stairs spanning between landing beams using the following data: Type of stair case : Dog legged with waist slab, treads and risers.
Number of steps in the flight = 10; Tread T = 300 mm; Riser R = 150 mm
Width of landing beams = 300 mm; Materials : M20 grade concrete and Fe415 HYSD bars. (20 Marks)

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