

ONE TIME EXIT SCHEME

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09ENG7.5

Seventh Semester B.Arch. Degree Examination, April 2018 Structures – VII

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer any FIVE full questions.
2. Use of IS 1343 is permitted.
3. Missing data, if any, may be assumed.

- 1 a. Explain Pre-Tensioned and Post tensioned PSC beam with sketches. (10 Marks)
b. What are the advantages and disadvantages of PSC over RCC? (10 Marks)
- 2 a. Explain load balancing concept with neat sketches. (05 Marks)
b. A concrete beam of symmetrical I-section spanning 10m has the width and thickness of flanges equal to 300mm and 60mm. The overall depth is 500 mm and thickness of web is 80mm. The beam is prestressed by straight cable with an eccentricity of 150mm. The prestressing force is 300 kN. The live load on the beam is 2 kN/m. Draw the stress distribution at midspan. (15 Marks)
- 3 a. Why high strength materials are used in PSC. (05 Marks)
b. A beam 400mm × 600mm and length 6m carries an UDL of 16 kN/m (Live load + D.L). The beam is simply supported and subjected to prestressing force 720 kN with straight cable. Determine the eccentricity for the straight cable so that no tension is allowed in the bottom of the beam. (15 Marks)
- 4 a. Explain friction loss in post tensioned beam. (05 Marks)
b. A pre-tensioned beam 250mm × 400mm is prestressed by 12 – 7 mm dia initially stressed to 1200 N/mm² with eccentricity 100 mm. Estimate the final percentage loss of prestress for the following data.
Creep coefficient = 1.6 ; Shrinkage strain = 0.0002 ; Relaxation = 3% ;
 $E_s = 210 \times 10^3 \text{ N/mm}^2$; $E_c = 35 \times 10^3 \text{ N/mm}^2$. (15 Marks)
- 5 a. Explain with neat sketches domes and shells. (10 Marks)
b. Explain with neat sketches folded plate and flat slab. (10 Marks)
- 6 a. Explain advantages and disadvantages of tensile structure and pneumatic structures. (10 Marks)
b. Explain Grid structures and Space frames with neat sketches. (10 Marks)
- 7 a. Draw sectional elevation and cross section for a cantilever beam with reinforcement details. (10 Marks)
b. Show the reinforcement details in one-way slab. Draw neat sketches. (10 Marks)
- 8 Draw plan and sectional elevation showing reinforcement details in dog-legged staircase. (20 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.