TCE-601

1046

Even Semester Examination 2018-19

B. TECH (Civil Engineering) (SEMESTER-VI)

DESIGN OF REINFORCE CONCRETE STRUCTURE

Time: 03:00 Hours

Max Marks :100

Note: All questions are **compulsory**.Draw diagrams wherever necessary.All questions carry equal marks. Use of IS 456-2000, IS 3370 (part-4)-2009, IS1893 (part-I)-2016 and 1343:2012 are permitted.

1. Attempt **any four** parts of the following : [5X4=20]

    (A) What are the advantages and disadvantages of pre-stress concrete?

    (B) What is the significance of response reduction factor?

    (C) Write short note on anchorage & tendon.

    (D) Differentiate between Intensity & Magnitude of an earthquake.

    (E) Explain the terms: (i) Solidity Ratio (ii) Gust Factor, (iii) Response Spectrum.

    (F) What is the purpose of providing confining ties in the columns?

2. Attempt **any four** parts of the following : [5X4=20]

    (A) Explain the difference between pre-tensioning and post-tensioning.

    (B) Explain the concept of ductile detailing in the beams & Columns with neat sketches.

    (C) Explain the Cantilever method of analyse for lateral load on the buildings.

    (D) What do you understand by impact factor?

    (E) What is Moment Redistribution? Enumerates its advantages.

(F)   A rectangular beam 250 mm wide and 600 mm deep, is prestressed by 14 mm diameter high tensile bars located 200 mm from the soffit of the beam. If the effective stress in the wires is 700 N/mm², what is the maximum bending moment that can be applied to the section without causing tension at the soffit of the beam?

3.   Attempt **any two** parts of the following :   [10X2=20]

(A)   Analyse the building frame subjected to horizontal force of 120 kN at joint A and 180 kN at joint E as shown in fig 1 by using Portal Method.
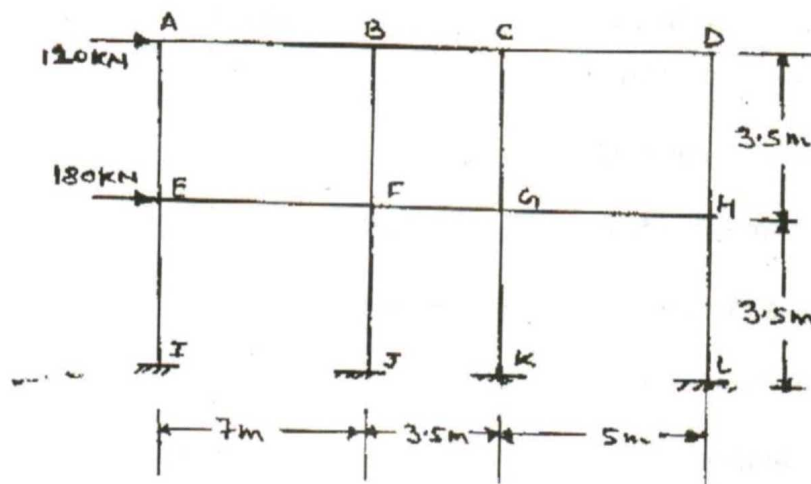

Fig1.

(B)   What are the special considerations taken while designing liquid retaining structures?

(C)   Explain the standard specification and general design consideration (with neat diagram whenever needed) required for the design of T-beam bridge.

4.   Attempt **any two** parts of the following :   [10X2=20]

(A)   Draw bending moment envelope diagram after 15% redistribution, for fixed ended beam of span 6m, carrying udl of 20kN/m.

(B)   Determine the percentage of total loss of prestress in a simply supported beam of rectangular cross section 150 mm wide and 300 mm deep, having 8 wires of 6

mm diameters subjected to an initial prestress of 1000N/mm² at an eccentricity of 50 mm. Take the following data

$E_s = 2 \times 10^5$ N/mm² and use M40 grade of concrete

Creep coefficient = 1.6 Loss due to relaxation = 5%

(C) Design the wall of a circular water tank of 500kl capacity. The depth of water in tank is 5 m. take height of top dome is 2 m and diameter of tank is (D) 11.30 m. Use M30 concrete and Fe 415 steel.

5. Attempt **any two** parts of the following :

[10X2=20]

(A) Calculate the amount of reinforcement required for a rectangular beam, continuous over four column supports of effective span 6m. The beam is subjected to a dead load of 10 kN/m and live load 15kN/m. use M20 grade of concrete and Fe 415 grade of steel. Also check the beam for shear requirements (i.e provide shear check only).

(B) Draw bending moment envelope diagram after 30% redistribution, for fixed ended beam of span 5m, carrying udl of 20kN/m.

(C) Explained different types of losses occurred in prestressed beam.

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