



Printed Pages : 3

TCE – 602

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0058

Roll No.

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B. Tech.

(SEM. VI) EXAMINATION, 2006-07

CONCRETE STRUCTURE - II

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (i) Attempt **all** questions.
 - (ii) All questions carry **equal** marks.
 - (iii) Use of IS : 456 is permitted
 - (iv) Assume any data suitably, if missing.

1 Attempt any **two** parts of the following : **10×2=20**

- (a) A flat slab is supported on 500 mm diameter columns spaced 6m x 5m apart in both directions. The column head has a diameter of 100 cm. The live load on the slab is 5 kV/m². Determine the unbalanced moments in an interior column. Also, check the flat slab in shear at an interior support.
- (b) What are the functions of drop panel and columns head in flat slab? Explain in sufficient details.
- (c) Design the interior panel of size 4.5 m x 5.5 m supported directly on columns of 500 mm diameter. The superimposed load on the slab is 2.5 kN/m².

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- 2 Attempt any **two** part of the following : **10×2=20**
- (a) Design a beam subjected to following :
Bending moment = 70 kN-m
Tensional moment = 30 kN-m
Shear force = 40 kN
 - (b) Design a footing for a brick wall 30 cm thick which is transmitting a load of 150 kN/m. The gross bearing capacity of soil is 100 kN/m².
 - (c) Design a footing for a 35 cm square column reinforced with S-20 mm Fe 415 grade steel bars carrying an axial load of 1000 kN. The bearing capacity of soil is 100 kN/m².
- 3 Attempt any **one** part of the following : **20×1=20**
- (a) A cantilever retaining wall has to retain earth 3.5 m high above ground level. The density of earth is 17 kN/m³, and its angle of repose is 30°. The earth is horizontal at top. The safe bearing capacity of soil is 180 kN/m² and coefficient of friction between soil and concrete is 0.55.
 - (b) Design a solid slab culvert of clear span of 5 m for class AA tracked vehicle loading. Clear width of road way is 7.0 m. The thickness of wearing coat is 70 mm.
- 4 Attempt any **two** parts of the following : **10×2=20**
- (a) Design a circular water tank with flexible base for a capacity of 450 kL. The depth of water is 4.5 m. Allow suitable free board.
 - (b) Write down all the steps for the design of staging of an overhead tank for vertical and lateral loads.

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- (c) Design the tank walls of a rectangular water tank $3\text{ m} \times 5\text{ m} \times 2.5\text{ m}$ resting on ground.

5 Attempt any **one** part of the following : **20×1=20**

- (a) Simply supported prestressed concrete beam $250\text{ mm} \times 450\text{ mm}$ is pre-tensioned by 9 wires of 8 mm diameter at an initial stress of 1200 N/mm^2 with their centroid located at an eccentricity of 70 mm. Find the total loss of prestress if there is relaxation of 4% of steel stress.
- (b) A prestressed concrete beam of rectangular cross – section of $300\text{ mm} \times 450\text{ mm}$ is carrying a superimposed distributed load of 150 kN/m over an effective span of 5.0 m. The prestressing force is 1500 kN and the tendons are located at 140 mm above the bottom fibre. Draw the distribution of stresses at mid span and end sections at various critical stages of loading.
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