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BICE-017

B. TECH. CIVIL ENGINEERING (BTCLEVI)
Term-End Examination
June, 2019

BICE—017 : STRUCTURAL DESIGN AND DRAWING—II

Time : 3 Hours   *Maximum Marks : 70*

Note : Attempt any five questions. Use of IS456-2000, IS800-2007 and Steel tables is allowed. Use of scientific calculator is permitted.

1. (a) Discuss the loss due to friction in post-tensioned members.   7

   (b) Explain in detail Gifford-Udall system of post-tensioning.   7

2. Explain briefly the various IRC loadings considered for design of bridges.   14

3. (a) What are the differences between plate girder bridges and truss girder bridges.   7

(b) Describe the factors for selecting the type of steel chimneys. 7

4. A prestressed beam 200 × 300 mm deep is prestressed with wires (area = 320 mm²) located at an constant eccentricity of 50 mm and carrying initial stress of 1000 N/mm². Span of beam is 10 m. Calculate the percentage loss of stress if wires are (a) pre-tensioned, (b) post-tensioned. Given : E_S = 210 kN/mm², E_C = 35 kN/mm², Relaxation = 5%, Creep coefficient = 1.6. Shrinkage of concrete = 300 × 10⁻⁶ for pre-tensioning and 200 × 10⁻⁶ for post-tensioning, slip at anchorage = 1 mm, frictional coefficient for wave effect = 0.0015 per metre.

14

5. Design a circular water tank with flexible connection at base for a capacity of 4,00,000 litres. The tank rests on a firm ground. The height of tank including a free board of 200 mm should not exceed 3.5 m. The tank is open at top. Use M-20 and Fe-415. 14

6. (a) Explain the various losses in pre-stressed concrete. 7

   (b) Differentiate between overhead tanks and Intze tanks with neat sketches. 7

7. Draw a neat sketch of a cross-section of an Intze water tank. Explain why ring beams are required in such a tank. 14