BICE-017

B.Tech. CIVIL ENGINEERING (BTCLEVI)
Term-End Examination
00275   December, 2014

BICE-017 : STRUCTURAL DESIGN AND DRAWING – II

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any **five** questions and assume any data if necessary. Use of IS 456 – 2000 and IS 800 is permitted.*

1. Write short notes on the following :   *2×7=14*

    (a) Post-Tensioning method

    (b) Forces acting on tall chimneys

2. Write down the steps for designing of plate girder railway bridges.   *14*

3. Write down the design steps for the following members of rectangular bunkers :   *5+5+4=14*

    (a) The vertical side walls

    (b) Hopper bottom

    (c) Edge beam

BICE-017   1   P.T.O.

4. Design a prestress concrete beam of span 10 m carrying imposed load of 15 kN/m². M 40 concrete and steel with ultimate tensile strength of 1600 N/mm² are used. The permissible stresses in concrete in compression = 14 N/mm², in tension = 0. Neglect the losses in prestress, carrying of 12 wires of 5 mm ϕ and effective prestressed force of 225 kN are available. Show the position of the cable. *14*

5. A reinforced concrete chimney has a wall thickness of 15 cm with a mean diameter of 2·5 m. The section is reinforced with sixty bars of 16 mm ϕ. If the effective wind pressure is 1·4 kN/m² on the projected area, evaluate the maximum stresses in concrete and steel at a section 25 m from the top of the chimney. Assume modular ratio = 15. *14*

6. Write the steps for designing of towers supported with foundation. *14*

7. Design an Intze-type water tank of 1 million litres capacity, supported on an elevated tower comprising of 8 columns. The base of the tank is 16 m above the ground level. Depth of the foundation is 1 m below the ground level. Adopt M-20 grade concrete and Fe-415 grade for steel. Design for top dome, top ring beam and cyllindrical tank wall only. *14*

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