

**B.Tech. CIVIL ENGINEERING (BTCLEVI)**

**Term-End Examination**

**June, 2018**

00033

**BICE-017 : STRUCTURAL DESIGN AND  
DRAWING – II**

*Time : 3 hours*

*Maximum Marks : 70*

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**Note :** Answer any **five** questions. All questions carry equal marks. Assume any missing data suitably, if required. Use of IS 456 : 2000, IS 800 : 2007 and steel tables is permitted. Use of scientific calculator is permitted.

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1. (a) Enumerate the losses in prestress in prestressed concrete beams. Why are there no similar losses in reinforced concrete beams ? 7
- (b) Discuss the advantages and disadvantages of pre-tensioning systems. 7
  
2. Write design steps for plate girder railway bridges giving neat labelled sketches wherever required. 14

3. Design the side walls and hopper bottom of a  $3\text{ m} \times 3\text{ m}$  square bunker to store 36 tonnes of coal. Density of coal is  $9\text{ kN/m}^3$  and angle of repose is  $30^\circ$ . Adopt M 20 grade concrete and Fe 415 grade HYSD bars. 14
  
4. Discuss the design criteria and write the steps for design of a simply supported prestressed concrete beam. 14
  
5. The wall of a reinforced concrete circular water tank is resting on bitumen filling at its base. The diameter of tank is 12 m and has 3 m of water when it is full. Find a suitable thickness for the wall and circumferential as well as vertical reinforcement required. Adopt M 20 grade concrete and Fe 415 steel. 14
  
6. Discuss the design criteria and write the steps for design of steel chimneys. 14
  
7. Write short notes on any *two* of the following :  $2 \times 7 = 14$ 
  - (a) Freyssinet system of post-tensioning
  - (b) Intze tanks
  - (c) Design criteria of pressed steel rectangular tanks