

**Diploma in Civil Engineering**

**Term-End Examination**

**June, 2007**

**BCE-045 : CONSTRUCTION DRAWING**

*Time : 2 hours*

*Maximum Marks : 70*

---

**Note :** *Part A is to be attempted on answer scripts and Part B on drawing sheet. Use of calculator is allowed. Assume suitable data wherever necessary.*

---

---

**PART A**

*Attempt any **five** questions.*

1. (a) What are the two ratios of the thickness of line (d) to the lettering height (h) recommended by the Code ? Explain the principle behind selecting these ratios for lettering in drawings.  $3\frac{1}{2}$
- (b) Define scale. Mention the standard categories of scales.  $3\frac{1}{2}$
2. What are the loads transmitted through foundations to the soil ? How are these loads accounted for in the design of a foundation ? 7

3. What are the methods to protect the RCC structures against the sulphate and chloride attack ? 7
4. Sketch the detailing of reinforcement for a combined rectangular footing with beam. Show one cross-section and one longitudinal section. 7
5. (a) Name the various types of steel rivetted joints. 2  
(b) Sketch the plan and elevation of double cover zig-zag rivetted butt-joint. 5
6. (a) Define the false ceiling and name the various types of false ceilings. 2  
(b) Sketch any one type of false ceiling. 5
7. Sketch the plan and sectional elevation of a dog-legged staircase. 7
8. (a) Why is a trussed roof preferred to a flat reinforced concrete roof ?  $3\frac{1}{2}$   
(b) Show by means of a line diagram a Queen post truss and name the various members.  $3\frac{1}{2}$

**PART B**

Attempt question number 1 which is **compulsory** and any one question from the remaining.

9. Draw the sectional elevation of a square RCC footing of size 2.2 m for an RCC column of size 400 × 450 provided at a depth of 1.0 m below the ground level for the following data : 10
- Longitudinal bars of the column 8 – 22  $\phi$  HYSD
  - Lateral ties in the column 6  $\phi$  @ 275 c/c
  - Overall depth of the footing 420
  - Depth of the footing at the edges 150
  - Reinforcement of the footing 16  $\phi$  HYSD @ 150 c/c both ways.
10. (a) A doubly reinforced rectangular beam is provided over a collapsible door opening of size 4 m × 2.5 m clear. Draw the longitudinal section and cross section of the beam with the following data : 10
- Clear span of the beam 4.0 m
  - Overall depth of the beam 300 mm
  - Width of the beam 250 mm
  - Tension reinforcement 4 bars of 16  $\phi$  HYSD
  - Compression reinforcement 3 bars of 12  $\phi$  HYSD
  - Shear reinforcement 4 Nos – 8  $\phi$  HYSD
  - 2 legged stirrups @ 120 c/c at each end and @ 200 c/c in the remaining part.

- (b) A single leaf double-panelled wooden door of size 1.0 m × 2.1 m with plywood panel inserts of 12 mm thickness is provided in a bedroom of a house.
- (i) Draw the elevation of the door. 10
- (ii) Draw the sectional plan of the door. 5
- 11. (a)** A T-beam roof is provided over a common hall of a hostel building. Draw the longitudinal and cross sections of the beam with the following data : 10
- Effective span of the beam 4.5 m
  - Overall depth of the beam 350 mm
  - Width of the beam 250 mm
  - Depth of the flange of T-beam 120 mm
  - Tension reinforcement 4 Nos — 20  $\phi$  HYSD
  - Compression reinforcement  
2 Nos — 20  $\phi$  HYSD
  - Shear reinforcement – 8  $\phi$  HYSD 2 legged  
Stirrups @ 150 c/c – 5 Nos at each end and  
@ 225 c/c in the remaining part
- (b) A single leaf fully glazed wooden door of size 1.25 m × 2.1 m with two glass panel inserts is provided in the library of the residential apartments.
- (i) Draw the elevation of the door. 10
- (ii) Draw the sectional plan of the door. 5