Diploma in Civil Engineering

Term-End Examination

December, 2006

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)   Why is an object preferably described in a graphical mode ?   5

    (b)   Which types of drawings are required for the construction of a structure ?   2

2.   What are the main considerations for fixing the depth of footing ?   7

3. (a) Explain under what circumstances the following footings are provided :   3

    (i)   Raft foundations without beams

    (ii)   Raft foundations with beams

  (b) Sketch the plan and reinforcement details of a raft foundation without beams.   4

4. (a) What are the main types of wooden joints ?   2

  (b) Sketch the plan and elevation of a lap joint with steel strap and bolts.   5

5. (a) Show by means of a sketch the various zones of typical butt-weld.   2

  (b) Show by means of sketches all types of welded joints.   5

6. Mention various architectural design aspects of a staircase.   7

7. (a) Why are curved roofs some times preferred over flat roofs ? $3\frac{1}{2}$

  (b) Why are thin shells and domes called stressed skin structures ? $3\frac{1}{2}$

8. (a) What is a shell roof ? What type of shell roofs are commonly used ?   3

  (b) What is the ideal form of the main reinforcement in a shell roof and in what shape is this reinforcement provided ? Show by means of a sketch.   4

PART B

*Attempt question number 1 which is **compulsory** and attempt any **one** question from the remaining. Adopt suitable scale.*

1. Draw the sectional elevation of a square RCC footing of size 2·1 m for a RCC column of size 400 × 400 provided at a depth of 1·2 m below the ground level for the following data :   *10*

   — Longitudinal bars of the column 8 – 20 φ HYSD

   — Lateral ties in the column 6 φ @ 300 c/c

   — Overall depth D of the footing 400

   — Depth of the footing at edges 150

   — Reinforcement of the footing 12 φ HYSD @ 100 c/c both ways

2. A T-beam floor of effective size 6 m × 12 m of an office building consists of an RCC slab spanning between ribs spaced at 3·0 m c/c. The effective span of the T-beam is 6 m. The design data is given below :

   — Overall depth of floor slab = 110 mm

   — Main reinforcement of slab 8 φ HYSD bars
                                                 @ 150 c/c

   — Distribution reinforcement of slab 6 φ bars
                                                 @ 300 c/c

   — Overall depth of beam 500 mm

Prepare the working structural drawing for the floor as follows :

(i)   A section of the floor along short span   8

(ii) A section of the floor along long span   8

(iii) A plan of the floor showing torsional reinforcement
      at corners in plan   9