3428

BOARD DIPLOMA EXAMINATION, (C–09)

APRIL/MAY—2015

DCE—FOURTH SEMESTER EXAMINATION

CIVIL ENGINEERING DRAWING—II

Time : 3 hours]   [*Total Marks* : 60

PART—A   4×5=20

Instructions : (1) Answer **all** questions.

(2) Each question carries **four** marks.

(3) Any missing data may be assumed suitably.

(4) This part need not be drawn to scale.

1. Sketch the cross-section of pipe along with bedding and benching of a pipe culvert with the following data :

   Internal diameter of the pipe = 1·00 m
   Thickness of pipe = 0·10 m
   No. of pipes = 1
   Thickness of concrete bed = 200 mm
   Width of concrete bed = 1800 mm
   Thickness of concrete benching = 350 mm

2. Draw the cross-section of an abutment of an RCC bridge from the following data :

      Bottom level of CC foundation bed = 51·00
      Top level of CC foundation bed = 51·50
      Bed level = 52·50
      Bottom level of RCC slab = 54·10
      Width of bed block = 600 mm
      Thickness of bed block = 250 mm
      Bottom width of abutment = 900 mm
         (same width up to bed level)
      Top width of abutment = 600 mm at bed block level with water face vertical
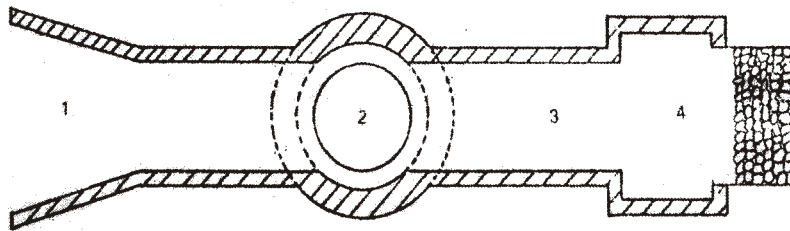
3. Draw the plan of a septic tank from the given specifications :

      Internal dimensions = 3·50 m × 1·20 m × 1·20 m
      Brick masonry wall thickness = 230 mm
      CC offset for masonry walls = 300 mm

4. Name the parts numbered 1 to 4 of the tank sluice whose plan is shown below :

5. The abutment of a surplus weir has a top width of 0·75 m. TBL is 62·000. Top and bottom levels of CC bed are 57·800 and 57·350 respectively. The abutment has a batter of 1 in 4 at water face and 1 in 6 at rear face. Sketch the cross-section of abutment. Offset of CC bed is 0·3 m on either side.

Instructions : (1) Answer **all** questions.

(2) Figures in the margin indicate marks.

(3) Any missing data may be assumed suitably.

(4) This part need to be drawn in given scale.

6. Draw the sectional elevation of a square RCC overhead tank with the following data to a scale of 1:50 :

Height of the tank (from GL to bottom of the tank i.e., top of floor slab or base slab) = 9·0 m
Size of tank = 4·5 m × 4·5 m × 1·5 m
Thickness of RCC side walls = 200 mm
Thickness of RCC base slab = 200 mm
Thickness of RCC roof slab = 120 mm
Size of RCC column = 400 mm × 400 mm
Nos. of RCC columns = 4 (one at each corner)
Size of RCC brace beams = 400 mm × 350 mm
Spacing of brace beams = 3·0 m C/C
Depth of RCC footing below ground level = 2·0 m
Size of footing at base = 1·6 m × 1·6 m
Thickness of footing at column face = 500 mm
Thickness of footing at the end = 200 mm
Thickness of leveling course below the footing = 200 m, (1:4:8) plain concrete
Size of ring beam below base slab = 400 mm × 450 mm
Dia. of inflow pipe = 100 mm
Dia. of outflow pipe = 75 mm
Dia of scour pipe = 75 mm
Size of manhole cover = 600 mm × 450 mm

Show the pipe connections, ladder and ventilating arrangements. 25

7. Draw the cross-section of non-homogeneous (zonal section) earthen bund with the following data : 15

Top width of bund = 2·5 m
Tank Bund Level (TBL) = +61·5 m
Full tank level (FTL) = +59·5 m
Maximum water level (MWL) = +60·2 m
General ground level = +51·00 m
Stripped ground level = +50·25 m
Side slopes = 2:1 on both U/s and D/s

Hearting :
Top width = 1·75 m
Side slope = 1:1
Top level = 60·2 (MWL)

Cut-off Trench :
Bottom width = 2·5 m
Side slopes = 1:1 (both sides)
Bottom level = +47·0

Sand Chimney :
Thickness = 1·25 m
Slope = 1:1

Casing or horizontal casing or sand blanket :
Thickness = 1·0 m and laid over longitudinal filter with its top level at +52·4

Rock Toe :
Top width = 1·2 m out of total width 2·4 m at the level +53·20
Side slope = 1:1 on both sides
Composition = Rock toe is filled with broken stones of varying size ranging from 200 mm to 500 mm

On the earthen bund side, rock toe is provided with 150 mm thick fine sand and below that 250 mm thick coarse sand

Longitudinal filter :
Bottom level of longitudinal filter is taken 400 mm below stripped ground level. It consists of rough stone of varying size 250 mm to 300 mm are laid to a depth of 0·75 m and fine and coarse sand layers of 150 mm and 250 mm thick respectively are laid at bottom and top of longitudinal filter on which casing of 1·0 m thick is provided. Bottom width of longitudinal filter = 1·5 m with 1:1 side slopes and same size filter media is provided in the cross filter and extended into the rock toe.

Toe Drain :
Bottom level = +49·55
Bottom width = 1·0 m
Side slopes = 1:1 on both sides
Bed pitching and side revetment = 300 mm thick of rough stones

Protection on upstream face : 450 mm thick rough stone revetment over 250 mm thick gravel backing

This revetment is founded on rough stone toe wall of 1·2 m wide and 1·2 m deep

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