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BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2017

DCE—FIFTH 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. Sketch the section at support of an RCC slab bridge showing bed block and abutment cross-section and name the parts.

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3. Draw the cross-section of a washbasin fixed to wall at a height of 750 mm with the following data :

Height of the room = 3000 mm

Slab thickness = 150 mm

Size of washbasin = 600 mm×400 mm

4. Sketch the central section along the tank bund of the well of a tower head sluice from the following :

Internal dia = 1· m

Height of well = 4·2 m

Thickness of well staining = 0·45 m from top to a depth of 2·0 m and 0·60 m for the remaining

CC foundation = 0·5 m thick with 0·3 m offset

Thickness of slab = 150 mm thick

Wooden shutter = 0·70 m wide × 1·2 m deep

Provide suitable rod and gearing rearrangement for the wooden shutter.

5. Draw the cross-section of any empty soak pit with lining with the following specifications :

Diameter (internal) = 900 mm

Circular lining = 230 mm thick brick lining with dry joints

Total depth of pit = 1·70 m

General ground level = 450 mm below roof slab

Inlet pipe with bend = 75 mm dia and kept at 250 mm below GL

Inside cement plastering = The inside of the wall is plastered with CM (1 : 3) to a thickness of 13 mm from top of the level of inflow (inlet) pipe

Roof covering = Covered with removable precast concrete slabs 70 mm thick

Casing around the circular lining on outer side = 75 mm thick outer casing is provided with coarse aggregate from bottom of the lining to the level of inlet pipe

Ordinary soil may be provided around the pit to form sloped connection with the ground and it may be turfed.

2 [*Contd...*

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

(2) Any missing data may be assumed suitably.

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

20+5=25

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 = 5·0 m×5·0 m×1·75 m

Thickness of RCC side walls = 200 mm

Thickness of RCC base/floor slab = 200 mm

Thickness of RCC roof slab = 110 mm

Size of RCC column = 400 mm×400 mm

No. of RCC column = 4 no. (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 levelling course below the footing = 200 mm, (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

Size of manhole cover = 600 mm×450 mm

Show the pipe connections; ladder, water level indicator, ventilating arrangements etc. Assume any other data suitably if needed.

7. Draw the longitudinal section of a tank sluice with tower head to a scale of 1 : 50.   15

(1) Tank bund :

   Top width = 1·8 m

   TBL = +163·500 m

   MWL = +162·000

   FTL = +161·300

   Bed level = +159·100

   Side slopes = 1½ : 1 on U/s and 2 : 1 on D/s

(2) Tower head :

   Internal diameter = 1·2 m

   Top of RCC slab over well = +162·50

   Thickness of well staining = 450 mm from top to a depth of 2 m and 600 mm for the remaining height

   Opening = 600 mm dia opening is provided in the CC diaphragm 75 mm thick for allowing water into the barrel.

   Shutter = Wooden shutter 750 mm wide, 1500 mm depth and 50 mm thick is provided for regulating water

   Foundation for well = 3·0 m dia and 600 mm thick

(3) Sluice barrel :

   Internal dimensions = 750 mm wide × 1·0 m height

   Roof for barrel = RCC roof slab 150 mm thick

   Side walls of the barrel = 450 mm thick at top and 600 mm thick at bottom with water face vertical

   CC foundation = 450 mm thick and 2550 mm wide is laid under barrel

(4) Lead chamber :

   Length of wing walls = 1·8 m (horizontal distance)

   Distance between wing walls inside to inside at the receiving end = 2·0 m

   Thickness of walls = 450 mm at top and 600 mm at bottom with water face vertical

Profile of wing walls = Wing walls start from +160·25 (top of barrel slab) at the entrance of the barrel and slopes down to the bed level +159·10. The slope from GL to bed level is 1½ : 1.

(5) Stilling cistern :

Internal dimensions : 3·0 m × 3·0 m

Side walls = All the side walls including the outer wall having an opening of 600 mm for discharging water into field channel are 600 mm thick at bottom and 450 mm thick at top, having batter on rear side. These walls are taken to canal bund level +160·75

(6) Canal particulars :

Bed width = 600 mm

Side slopes = 1 : 1 on water side and 1½ : 1 on rear side up to GL

Bed level = +159·10

Width of canal bund = 900 mm

Canal bund level = +160·750

(7) Rough stone revetment :

(i) 450 mm rough stone revetment is provided on U/s over 150 mm thick gravel backing from bed level to TBL

(ii) Sides of canal are provided with 300 mm thick rough stone revetment over 150 mm thick gravel backing for a length of 1·5 m. Bed pitching is also provided in the canal to a length of 1·20 m with 300 mm size rough stone and a toe is provided at its end and taken to a depth of 600 mm below bed level of canal.

Width of toe = 300 mm

(8) General ground level at the site = +159·50

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