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BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2018

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) Part—A need not be drawn to a 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 m

Thickness of pipe = 0·10 m

No. of pipes = 1

Thickness of concrete bed = 300 mm

Width of concrete bed = 180 mm

Thickness of concrete benching = 350 mm

2. Draw the half sectional elevation of the slab culvert of single span showing the abutment, deck slab, wearing coat, parapet, etc.

3. Draw the plan of a septic tank from the following specifications :

Internal dimensions = 4·5 m × 1·5 m × 1·2 m

Brick masonry wall thickness = 230 mm

CC offset for masonry walls = 300 mm

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4. Draw the cross-section across the well of a tank sluice with tower head for the following data :

Internal diameter = 1·2 m

Height of well = 4·2 m

Thickness of RCC slab = 150 mm

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

Foundation = 3 dia and 600 mm thick CC foundation

Wooden shutter = 0·7 m wide × 1·2 m deep

Provide suitable rod and gearing arrangements.

5. The abutment of a surplus weir has a top width of 0·75 m. TBL is 60000. Top and bottom levels of CC bed are 55,800 and 55,350 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.

PART—B 40

Instructions : (1) Answer **all** questions to a scale.

(3) Any missing data may be assumed suitably.

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 GI to bottom of the tank, i.e., top of floor slab or base slab) = 9 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

No. of RCC columns = 4 Nos (one at each corner)

Size of RCC frace beams = 400 mm × 350 mm

Spacing of frace beams = 3·0 m/cc

Depth of RCC footing below ground level = 2 m

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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 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

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-homogenous (zonal section) earthen bund with the following data : 15

Top width of bund = 3 m

Tank bund level (TBL) = + 45·70

Full tank level (FTL) = + 43·60

Maximum water level (MWL) = + 44·50

General ground level = + 33·60

Stripped ground level = + 33·10

Side slopes = 2 : 1 on U/S and 2·5 : 1 on D/S

A berm of 1·8 m wide shall be provided at + 38·20 on rear face

Hearting :

Top width = 1·8 m

Side slopes = 1 : 1

Top level = + 44·50 (MWL)

Cut off trench :

Bottom width = 3 m

Side slopes = 1 : 1 (both sides)

Bottom level = + 28·60

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Sand chimney (on rear face of hearting zone) :

Thickness = 1 m
Slope = 1 : 1

Casing or horizontal casing or sand blanket :

Thickness = 900 mm and laid over longitudinal filter with its top level at + 35·10

Rock toe :

Top level = + 35·60
Top width = 1·5 m
Side slopes = 1 : 1 on both sides
Composition = Rock toe is filled with broken stones of varying size ranging from 150 mm to 300 mm
On the earthen bund side, rock toe is provided with 150 mm thick fine sand and below that 200 mm thick coarse sand

Longitudinal filter :

It consists of rough stone of varying size 150 mm to 250 mm are laid to a depth of 0·7 m and fine and coarse sand layers of 150 mm and 200 mm thick respectively are laid at bottom and top of longitudinal filter on which casing is provided. These sand layers shall be laid below stripped ground level at + 32·75 on which rough stones are arranged between sand layers. Bottom width of longitudinal filter = 2·5 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 = + 32·60
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 150 mm thick gravel backing

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

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