C-16-C-506

6625

BOARD DIPLOMA EXAMINATIONS

DCE-FIFTH SEMESTER

SEPTEMBER/OCTOBER-2020

CIVIL ENGINEERING DRAWING - III

Time: 3 hours Max. Marks: 60

PART – A **5 X 4 = 20**

Instructions: *1. Answer **all** questions.*
*2. Each question carries **four** Marks.*
3. Part A may be drawn not to scale.
4. Assume suitable data if necessary.

1. Draw the cross section of a body wall (head wall) for a pipe culvert and name the parts.

2. Draw the cross section of an abutment of an RCC slab bridge, showing the bed block and name the parts.

3. Draw the plan of a septic tank with the following data.

Internal dimensions	-	3300 mm X 1600 mm.
Brick masonry wall thickness	-	230 mm
C.C offset for masonry walls	-	200 mm.

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

Internal diameter	= 1·20 m
Height of wall	= 4.5 m
Plat form slab thickness	= 0.15 m
Thickness of well staining	= 0.40 m from top to a depth of 2.5 m and 0.60 m for the remaining height
C.C foundation	= 0.60 m thick with 0.30 m offset.
Wooden shutter	= 0.7 m wide and 1.0 m deep.

Provide suitable rod with screw gearing arrangement for the wooden shutter.

5. Name any four component parts of a canal regulator.

PART – B

Instructions: *1. Answer all questions*
2. Assume suitable data if necessary

6. Draw the sectional elevation and plan of a square RCC overhead tank to a scale of 1:100 with the following data: **- 25M**

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	= 4.8 m × 4.8 m × 1·8 m
Thickness of RCC side walls	= 200 mm
Thickness of RCC base/floor slab	= 200 mm
Thickness of RCC roof slab	= 120 mm
Size of RCC column	= 400 mm × 400 mm
Nos. of RCC columns	= 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	= 2·0 m below ground level
Size of footing at base	= 1·8 m × 1·8 m
Thickness of footing at column face	= 500 mm
Thickness of footing at the end	= 200 mm
Thickness of leveling course below the footing	= 300 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 cross-section of a homogeneous earthen bund with the following Specifications to a scale of 1:50. **– 15M**

Top width of bund	= 1·4 m
Tank Bund Level	= +56·00 m
General ground level	= +50·00 m
Stripped ground level	= +49·70 m
Side slopes	= 1·5:1 on U/S side and 2 :1 on D/S side.
Key trenches	= 1·2 m wide and 0·7 m deep at 4·0 m c/c

Protection of U/S face of the bund : The U/s face of the bund is provided with 300 mm thick rough stone revetment over 150 mm thick gravel backing. This revetment is founded on a rough stone wall 900 mm wide and 900 mm deep.

Protection of D/S toe of the bund : A rock toe with 300 mm rough stone boulders is provided with 1000 mm top width and top level being at +51·20.

Side slopes of rock toe	= 1: 1
Sand filter	= 200 mm thick on rear side and at the bottom of the rock toe.
Toe drain	= A longitudinal drain is provided with bottom width 1.2 m and side slopes 1:1. This is in line with the outer surface of rock toe and taken to a level of +48·70. Rough stones of 300 mm thick are used for side revetment and bed pitching of toe drain.

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BOARD DIPLOMA EXAMINATION, (C–16)

NOVEMBER—2020

DCE—FIFTH SEMESTER EXAMINATION

CIVIL ENGINEERING DRAWING–III

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 suitably assumed.

(4) Part–A need not to drawn to scale.

1. Draw the cross section of a pipe culvert from following data :
Diameter of pipe = 1·0 m
No. of Pipes = 2
Distance between centre of pipes = 1·7 m
Thickness of concrete bed = 150 mm
Concrete offset on either side = 200 mm
Thickness of concrete benching = 450 mm

2. Sketch cross section of an abutment of a T-beam and slab bridge with following data :
Road formation level = +102·50 m
Bottom level of RCC slab = +102·30
FSL = +101·50
BL = +100·000

Top level of CC bed for abutment = +99·00

Thickness of RCC slab = 200 mm

Depth of T-beam = 500 mm

Size of CC bed block = 600 mm × 600 mm × 150 mm

Top width of abutment = 700 mm

Bottom width of abutment = 1200 mm

Abutment batter on rear side above bed level and uniform width below bed level, width of CC bed = 1600 mm

Thickness of CC bed = 500 mm

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

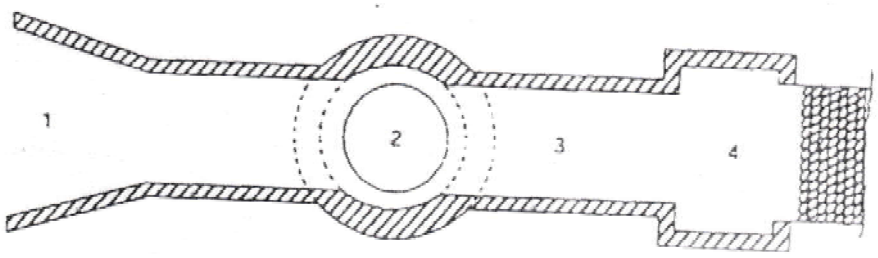
Internal dimensions = 2 m × 1 m × 1·5 m

Brick masonry wall thickness = 230 mm

CC offset for masonry walls = 300 mm

Scum board and baffle wall of 100 mm thick are provided at 900 mm from the inlet and outlet end walls respectively.

4. Plan of Tank sluice is shown in the figure. Write the name of the parts from 1 to 4.



5. The abutment of a surplus weir has a top width of 0·75 m. TBL is +62·000. Top and bottom level 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. Offset of cc bed is 0·30 m on either side. Draw the cross section of the abutment.

PART—B

25+15=40

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

(2) Any missing data may be suitably assumed.

(3) Part–B must be drawn to scale.

6. Draw the sectional elevation of RCC over head tank to a scale of 1:50 with following details. 25

Height of tank above GL up to the bottom of the tank = 9 m

Size of tank = 5 m × 5 m × 2 m

Thickness of sidewalls = 200 mm

Thickness of base slab = 200 mm

Thickness of roof slab = 100 mm

Size of columns = 400 mm × 400 mm (4 nos)

Size of brace beams = 300 mm × 300 mm

Spacing of brace beams = 3 m C/C

Size of ring beams below the base slab = 300 mm × 350 mm

Size of RCC footing = 1·6 m × 1·6 m

Depth of RCC footing = 1·5 m below GL

Thickness of footing at column face = 500 mm

Thickness of footing at the end = 200 mm

Thickness of leveling course with CC (1 : 4 : 8) = 200 mm

CI Inlet pipe = 200 mm dia and outlet pipe = 150 mm dia

Diameter of washout pipe = 100 mm

Ventilating pipe = 200 mm dia

Overflow pipe at the bottom of the roof slab = 100 mm dia

Size of manhole cover = 600 mm × 400 mm

Also show the inlet pipe, outlet pipe, water level indicator, manhole, ladder, ventilating pipe, over flow pipe and wash out pipe etc.

7. Draw the cross section of a homogeneous earthen bund with the following specifications to a scale of 1:50. 15

Top width of bund = 2·0 m

TBL = +56·00

General ground level = +49·00

Stripped ground level = +48·70

Slide slopes 1½ : 1 on U/S and 2 : 1 on D/S

Key trenches = 1·2 m wide and 0·6 mm deep at 4·0 m C/C.

Protection to the upstream face of the bund :

The upstream face of the bund is provided with 300 mm thick rough stone revetment over 150 mm thick gravel backing. This revetment is founded on rough stone wall 1·0 m wide and 1·0 m deep.

Protection to a D/S toe of the bund :

A rock toe with 300 mm rough stone boulders is provided with 900 mm top width and top level being at +50·20.

Slope of rock toe = 1 : 1

Sand filter = 200 mm thick on rear side and at the bottom of the rock toe.

Toe drain = a longitudinal drain is provided with bottom width 1·0 m and slide slopes 1 : 1. This is in line with the outer surface of the rock toe and taken to a level of +48·00.

Rough stones of 300 mm thick are used for side revetment and bed pitching of toe drain.

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