7429

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

DCE - FOURTH SEMESTER EXAMINATION

CIVIL ENGINEERING DRAWING—II

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

PART—A 10×2=20

Instructions : (1) Answer **all** questions.
(2) Each question carries **ten** marks.
(3) All parts must be drawn to scale.
(4) Any missing data may be assumed suitably.

1. Draw the longitudinal section of a septic tank to a scale of 1 : 20 from the given specifications.

Specifications :

Internal dimensions	=	900 × 2750 mm
Brick masonry wall thickness	=	230 mm
Thickness of C.C. bed	=	500 mm
C.C. offset for masonry walls	=	300 mm
Depth of water	=	1000 mm
Free board	=	300 mm
Thickness of R.C.C. roof panels	=	100 mm and width 450 mm fitted with bent handles for lifting
Scum board	=	R.C.C. precast slab 75 mm thick fixed at a height of 300 mm from floor level and extending upto a height 150 mm below roof. This shall be fixed at a distance of 900 mm from inside of wall at inflow end into a groove 75 mm deep.
Standing baffle	=	R.C.C. precast slab 75 mm thick kept on floor at a distance of 600 mm from inside of wall at out flow end. The top of baffle shall be 150 mm below water level.

Inflow and outlet pipes	=	100 mm dia. Tee shaped pipes
Vent pipe	=	50 mm dia AC pipe with a cowl extending to a height of 2.0 m above G.L.
Masonry pedestal	=	450 mm dia. circular brick masonry pedestal shall be provided around the vent pipe up to G.L.
General ground level	=	300 mm above top of R.C.C. precast roof panels.

2. Draw the cross-section of a homogenous earthen bund with the following specifications to a scale of 1 : 50.

Top width of bund	=	1.5 m
TBL	=	+57.00, General ground level = +50.00
Stripped ground level	=	+49.70
Side slopes	=	1½ : 1 on U/S and 2 : 1 on D/S
Key trenches	=	1.2 m wide and 0.6 m deep at 4.0 mC/C

Protection of 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 of a downstream face of the bund : A rock toe with 300 mm rough stone boulders is provided with 900 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 = 1.0 m and side slopes = 1 : 1.

This is in line with the outer face of rock toe and taken to a level of +49.00.

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

PART—B

20×2=40

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

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

(3) All parts must be drawn to scale.

(4) Any missing data may be assumed suitably.

3. Draw the longitudinal sectional elevation and half plan at bottom and half plan at top of the R.C.C. slab culvert to the scale of 1 : 50 with the following specifications.

(a) **Foundations :**

Foundations for abutments and wing walls are taken to the same level

Bottom level of levelling course (CC) = +50.80

Top level of levelling course = +51.10

Width of levelling course = 1.5 m

Thickness of C.C foundation bed = 0.5 m

Width of C.C foundation bed = 1.5 m

Top level of C.C foundation bed = bottom level of abutment and wing walls = +51.60

Bottom width of abutment = bottom width of wing walls = 0.9 m

Bed level = +52.60

(b) **Super structure :**

Profile of abutments and wing walls = width of abutment and wing walls is 0.9 m upto bed level. From bed level the water face is kept vertical and the rear (earth retaining side) side has a batter such that top width is equal to 0.6 m (at bed block level).

Thickness of bed block = 250 mm.

Width of bed block = 600 mm

Bottom level of R.C.C. slab = +54.20

Thickness of slab = 200 mm

Thickness of wearing coat = 100 mm

Top level of wearing coat = +54.50

Kerb width = 200 mm

Top level of kerb = +54.75

Thickness of parapet wall = 400 mm

Top level of parapet wall = +55.25

Length of abutment = 8.6 m

Width of road way = 7.4 m

Length of wing wall = 2.8 m

(c) **Vent way and other protection works :**

Width of vent way = 2.0 m

Height of vent way = 1.6 m

Bed pitching = 200 mm boulders are provided as bed pitching in the vent way

Cutoff walls = 200 mm thick are provided at the ends of vent way

Top level of cut- off wall = B.L = +52.60

Bottom level of cut-off wall = +52.00

CC bed for cut off wall = foundation for cut off walls consists of C.C. bed 800 mm wide and 300 mm depth.

(d) **Side slope revetment :**

The side slopes of the stream are provided with 200 mm size rough stone boulders at a slope of 1 : 1 from bed level to formation level.

4. Draw the following views of a "canal drop" to scale of 1 : 50 with the given specifications.

(a) Longitudinal section

(b) Half plan at top – half plan at foundation

Specifications :

(a) **Canal Particulars :**

	Up stream side	Down stream side
Ground level at site	+133.750	+133.750
Bed level	+133.200	+132.000
F.S. L	+133.650	+132.450
Canal bund level	+134.100	+134.100
Canal bed width	I.50m	1.20 m
Canal bund width	1.00 m	1.00 m
Side slopes in cutting	1:1	1:1
Level of 1.0 m wide berm	+ 133.750	+133.750
Slopes in embankment		
Water face	1½:1	1½:1
Rear face	2:1	2:1

(b) **Body wall :**

Top level	=	+133.200
Bottom level	=	C.C. foundation top level = +132.00
C.C. foundation bottom level	=	+131.250
Top width	=	600 mm
Bottom width	=	1000 mm with U/S face vertical.
length	=	8.50 m
Width of C.C. foundation	=	1.6 m with equal offset on either side

[*Contd...*

(c) **Notch wall:**

Thickness of notch wall	=	450 mm
Top level of notch wall	=	C.B.L = +134.100
No. of notches	=	1 No
Shape	=	Rectangular
Sill level of notch	=	U/S bed level
Width of notch	=	1.0 m

(d) **C.C. apron on D/S Drop :**

C.C. apron shall be provided in continuation with C.C. bed under body wall with same thickness (750 mm). Length of C.C apron from the edge of C.C. bed under body wall is 3.0 m.

Top level of C.C. apron = bed level of canal on D/S = +132.000

(e) **Rough stone bed pitching :**

Upstream side : Bed pitching consists of 300 mm size stone boulders to a length of 1.5 m including toe.

Downstream side: Bed pitching consists of 300 mm size stone boulders to a length of 3.40 m including toe.

(f) **Revetment to canal slopes :**

(i) **Length on U/S side :** Revetment is provided to the sides of canal from bed level to F.S.L for a length of 3.0 m with 300 mm size stone boulders. A slope of 1:1 is given at the end of side revetment to connect F.S.L and bed level.

(ii) **Downstream side :** Revetment for downstream canal side slopes starts from canal bund level at the notch wall and is taken to a level +133.650 (F.S.L on U/S) at the end of C.C. apron in an inclined direction.

From the end of C.C. apron revetment is continued at the same level (+ 133.650) upto the end of rough stone pitching and vertically dropped to the level of +132.750. From this point, revetment is continued at the same level for a distance of 3.40 m. 300 mm size rough stone boulders are used for revetment. The end of revetment is given a slope of 1 : 1 in order to reach canal bed level on D/S.

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