

c20-c-406

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BOARD DIPLOMA EXAMINATION, (C-20)
NOVEMBER/DECEMBER—2022
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. Sketch the section of a homogeneous tank bund with the given data :
Top width = 1.2 m, TBL = +62.00, GL = +58.00, stripped GL = +57.60,
free board = 1m, side slopes = 1.5:1 on U/S and 2:1 on D/S,
key trenches = 0.6 m× 1.2 m @ 4 m C/C, revetment = 300 thick rough
stone over 150 mm gravel backing, toe drain = 1 m bed width and 1 m
below GL with 1 : 1 side slopes. Also provide rock toe and toe wall below
revetment.

2. (a) Draw the cross-section across a bowl type urinal in water closet fitted
to the wall 230mm wide, 2.10m high.
(b) Draw the cross-section across a wash basin fitted to the wall having
same specification as mentioned above.

Assume standard sizes for urinal and wash basins. Wash basin rim at
height of 750mm from the floor level and bowl of urinals is at height of
600 mm from floor level.

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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 plan of pipe culvert to the following particulars to a scale of 1:50 :

(a) Drain particulars :

Bed level = +50.350

Bed width near the pipe culvert = 1200 mm

Side slopes of drain = 1:1

General G.L near the drain = +51.550

Bed pitching and side slope revetment on both U/S and D/S = 200 mm rough stone bed pitching to a length of 1200 mm shall be provided both on U/S and D/s. A toe of same width (200mm) shall be taken to a level of + 50.00 at the end of bed pitching.

Side slope revetment shall be with 200 mm size rough stone along the slopes to a length of 1200mm both on U/S and D/S from B.L to general G.L.

(b) Pipe details :

Internal dia of C C pipe = 1000 mm

External diameter = 1200 mm

Bedding for the pipe= 250mm C.C.

Benching for the pipe = 300mm C.C

Width of both bedding and pitching = 1800 mm

Bottom level of C.C bedding = + 50.00

No of pipes = one

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(c) Head walls *

At the end of pipe, two head walls are provided with brick masonry with the following details :

Length of head wall = 7200 mm

Bottom level of head wall = +49.10

Top level of C.C bed provided under head walls = + 49.10

Bottom level of CC bed provided under head walls = + 48.80

Width of CC bed = 1800 mm

Bottom width of head wall = 1200 mm

Profile of head wall = Outer surface vertical and earth fill face having a batter so that the top width = 450mm.

Top level of head wall = + 52.00

(d) Earth fill and embankment

Formation width = 6 m

Side slopes = 2 horizontal to 1 vertical

Formation level = + 54.00

Formation of earth fill = 2.550 m

Guide stones on both the sides of formation : 450mm×450mm square guide stones are provided at a distance of 450 mm from extreme edges of formation. These stones are taken to a depth of 600mm below formation level and extend to a height of 700mm above formation level at 3000 mm c/c.

4. Draw the half-plan at foundation and half-plan at top of a surplus weir to a scale of 1:50 with the following specifications :

(a) Hydraulic particulars :

TBL = +56.20 width of tank bund = 1.20 m

MWL = +54.20 FTL = +53.50

GL on U/S of weir = +53.00 (in the tank)

GL on D/S of weir = +52.50

Side slopes of tank bund = 2 : 1 on both U/S and D/S

(b) Weir/body wall :

Length in between abutments = 40 m Width at bottom = 1.20 m
Width at top = 0.60 m with equal batter on both the sides
Width of CC bed = 1.80 m with equal offset on either side.
CC foundation for abutments, wing walls and returns both on U/S and D/S shall be provided at the same level as that of CC foundation for weir wall.

(c) Abutments :

Width at bottom = 1.80 m width at top = 0.6 m.
Water face vertical and battered on earthen side.
Length of abutment = width of tank bund = 1.20 m
C.C foundation at top level = +51.80
C.C foundation at bottom level = +51.20
Concrete offset = 300 mm

(d) Wing walls :

Upstream side :

Projected length = 4.0 m from bottom weir wall
Splay = 1 in 5
Width at bottom = 1.8 m at the junction with the abutment and rear face of wing wall gradually narrows so that the width at bottom is 0.9 m at the junction with return walls
Top width = 60 mm with water face vertical and battered on earthen side.

Downstream side :

Projected length = 5.0 m from bottom weir wall.
Splay = 1 in 4
Width at bottom = 1.8 m and the rear side is parallel to front side.
Thickness of bottom is uniform, throughout the wing and return on D/S
Width at top = 600 mm with water face vertical and battered on Earthen side
CC foundation at top level = +51.80
CC foundation at bottom level = +51.20
Foundation offset = 300 mm

(e) Return walls :

Upstream side : Length = 3.20 m as measured on the outer face of
The walls top level = +54.00 width at bottom = 900 mm

Width at top = 600 mm with water face vertical and battered on
Earthen side.

Downstream side :

Length = 3.20 m as measured on the outer face of the
Wall top level = +54.00

Width at bottom = 1.80 m

Width at top = 600 mm with water face vertical and battered on
Earthen side

Horizontal stone masonry apron with 300 mm size boulders is
provided on the D/S over the length of wing wall.

(f) Revetment :

A slope of $1\frac{1}{2} : 1$ is adopted to connect bund from top of return wall
to G.L both on U/s and D/s at the end of the return.

Horizontal stone masonry apron with 300 mm size boulders is
provided on the D/S over the length of wing wall.

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