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C14–C–507

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BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2016

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. Draw the plan of a two-span (each 3·0 m) RCC T-beam bridge and label the components.

2. Draw the cross-section of a pipe culvert from the following data :

Diameter of pipe = 1·2 m

No. of pipes = 2

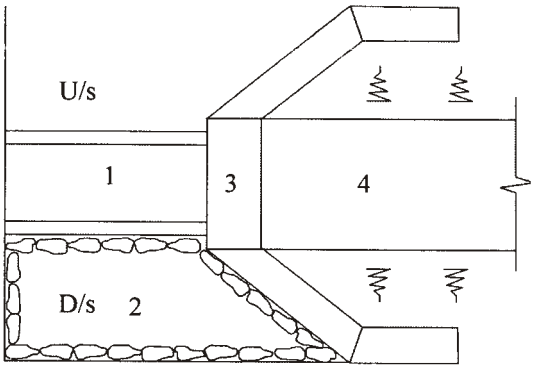
Distance between the centers of pipes = 1·9 m

Thickness of concrete bed = 150 mm

Concrete offset on either side = 250 mm

Thickness of concrete benching = 500 mm

3. Half plan at top of a surplus weir is shown in the figure below :



Name the component parts 1 to 4.

4. Draw the longitudinal section of the body wall of a canal drop with the following data :

Length of body wall = 9·0 m

Top of notch pier = + 45·00 m

Top of body wall = + 44·00 m

Top of CC foundation = + 42·80 m

Bottom of CC foundation = + 42·20 m

Offset of CC foundation = 0·3 m on either side

Notch = Trapezoidal shape with bottom width 0·6 m and side slopes = 1 : 1

5. Draw the sectional plan of RCC overhead tank from the data given below :

Size of water tank = 4500 mm × 4500 mm

Thickness of sidewalls = 200 mm

Columns' size = 400 mm × 400 mm

Size of column footings = 1500 mm × 1500 mm

Size of brace beams = 300 mm × 300 mm

PART—B

25+15=40

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

(2) Figure in the margin indicate marks.

(3) Any missing data may be assumed suitably.

(4) This part needs to be drawn in the given scale.

6. Draw the longitudinal sectional elevation and plan of pipe culvert to the following particulars to some suitable scale : 25

(1) Drain particulars :

Bed level = + 60·350 m

Bed width near the pipe culvert = 1200 mm

Side slopes of drain = 1 : 1

General ground level near drain = + 61·550 m

Bed pitching and revetment = 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 (200 mm) shall be taken to a level of + 60·00 at the end of bed pitching

Side slope revetment 200 mm size

Rough stone along the slopes to a length of 1200 mm both on U/s and D/s from bed level to general ground level

(2) Pipe details :

Internal dia of CC pipe = 1000 mm

External dia of CC pipe = 1200 mm

Thickness of CC bedding for the pipe = 300 mm

Thickness of CC benching for the pipe = 350 mm

Width of both bedding and benching = 1800 mm
Bottom level of CC bedding = + 59·95

Number of pipes = 1

(3) Headwalls :

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

Length of headwall = 7200 mm

Bottom level of headwall = + 59·10 m

Top level of CC bed provided under headwalls = + 59·10 m

Bottom level of CC bed provided under headwalls = + 58·80 m

Width of CC bed = 1800 mm

Bottom width of headwall = 1200 mm

Profile of headwall = Outer surface vertical and earthfill face having a batter so that the top width is 450 mm

Top level of headwall = + 62·00 m

(4) Earthfill and embankment :

Formation width = 10000 mm

Side slopes = 2 horizontal to 1 vertical

Formation level = + 64·00 m

Height of earthfill = + 64·00 – 61·45 = 2·55 m

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

7. Draw the cross-section of a homogeneous Earthen Bund with the following specifications, at a scale of 1 : 100 : 15

Top width of bund = 1600 mm

TBL = + 60·50 m

General ground level = + 53·00 m

Stripped GL = + 52·80 m

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

Provide key trenches of 1250 mm wide and 700 mm deep at 3600 mm c/c.

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 toe of 1000 mm wide and 1300 mm deep. On D/s face, a rock toe with 300 mm rough stone boulders is provided with 1000 mm top width and top level being at + 54·20 m. Take side slope of rock toe as 1 : 1. Provide sand filter of 200 mm thick on rear side and at the bottom of the rock toe. Provide a longitudinal drain with bottom width 1000 mm and side slopes 1 : 1. This is in line with the outer surface of rock toe and taken to a level of + 51·00 m. Rough stones of 300 mm size are used for side revetment and bed pitching of toe drain.

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