# 4617

## BOARD DIPLOMA EXAMINATION, (C-14)
## OCTOBER/NOVEMBER-2018
## DCE– FIFTH SEMESTER EXAMINATION

### CIVIL ENGINEERING DRAWING - II

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

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### PART - A

4X5=20

*Instructions    :*    1. Answer **All** questions.
2. Each question carries **four** marks.
3. Drawing to a scale is not necessary.
4. Assume suitable data wherever necessary

1.  Draw the cross section of pipe culvert with following details:

    External dia of pipe = 1.2m
    Thickness of pipe = 100mm
    Bedding below pipe 300mm depth and 2000mm wide
    Benching is 400mm above bedding.

2.   Draw the plan of bridge culvert and indicate the components.

3.  Draw the sectional elevation along the length of European type water closet in a room of size 1.5m x 1.2m. and also show the arrangement of flushing cistern and the traps. Thickness of wall 300mm, height of roof is 2.70m

4.  Longitudinal section of a canal drop is shown in figure, name the parts numbered from 1 to 5.
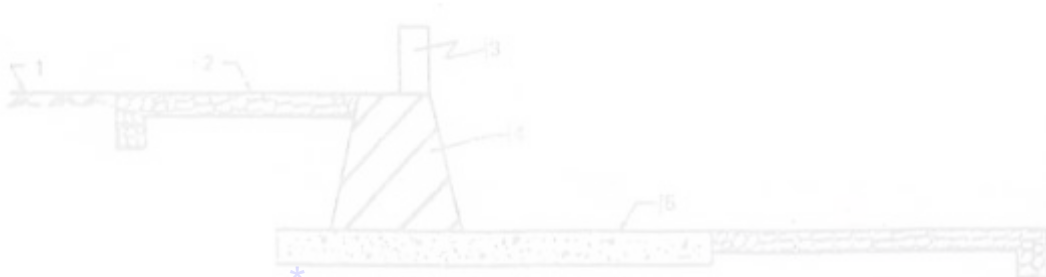
5. The abutment of a surplus weir has a top width of 0.75m TBL is 62.000m. Top and bottom levels of C.C. bed are 57.800m and 57.350m respectively. The abutment has a batter of 1 in 4 at water face and 1 in 6 at rear face. Sketch the cross section of abutment. Offset of CC bed is 0.3m on either side.

**PART-B**

40Marks

*Instructions* :     1. Answer **both** questions.
                    2. Any missing data can be assumed suitably.

6. Draw the following vies of a small T-beam and deck slab bridge of two spans across a canal to a scale of 1:100 from the given specifications given below. Type of structure is box type.

         (a) Half cross section and half elevation along the road mentioning the

             component parts.

         (b) Half plan at bottom and half plan at top.

**Specifications:**

| | | |
|---|---|---|
| No. of spans | - | 2 No's |
| Each span | - | 3.5 m |
| Bed level of canal | - | + 150.00 m |
| F.S.L. | - | + 152.00 m |
| Free board | - | 1.0 m |
| Road formation level | - | + 153.72 m |
| Side slopes of canal | - | 1:1 |
| Road width between parapets | - | 4.40 m |
| Road width between kerbs | - | 4.10 m |
| Kerb on either sides | - | 150 mm x 150 mm |
| Wing walls | - | Return type |

**Foundation :**

     The depth of foundation is same for abutment, wing walls and pier and taken to a level of +149.30m

Depth of C.C. bed below abutments, wing walls and pier is same and equal to 400mm i.e., top level of C.C. bed = +149.70m and bottom level of C.C. bed = +149.30m

## Width of C.C. bed:

(a) For abutments = 1700mm

(b) For wing walls = 1400mm

( c) For pier = 1000mm

Bottom width of stone masonry abutment at +149.70m level = 1300mm; length 5.9m. Bottom width of stone masonry wing walls at +149.70m level = 1000mm; length (as measured on outer side) = 3.9m

## Pier:

Width of stone masonry for pier is 600mm and is same throughout the height (up to bed block). Cut water sharp at $60^o$ and ease water semi-circular shape provided.

## Top width of abutment and wing walls:

The water face is vertical and rear side (earth retaining side) has a batter both for abutments and wing walls.

Top width of abutment = 700mm

Top width of wing wall = 500mm

## T-beams :

Three no. of T-beams are provided one at the center and one on either side at 2m C/C having equal overhang of deck slab on both sides.

Width of rib = 250mm

Depth of rib = 500mm

Bearing for T-beams over abutments = 500mm

## C.C. bed blocks:

T-beams are laid over C.C. bed blocks provided over the abutments and wing walls. Size of bed block is 600mm x 600mm x 150mm and is laid below the ribs of T-beam

## R.C.C. Deck slab:

200mm thick R.C.C. (1:2:4) slab is provided with 20mm thick wearing course (C.C. 1:1½ :3) with 8mm size stone chips. Width of R.C.C. deck slab = 4.9m

Assume suitable parapet and side revetments

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7. Draw the cross-section of non-homogeneous (zonal section) earthen bund with the following specification to a scale of 1:100

**1. Hydraulic particulars:**

| | | |
|---|---|---|
| T.B.L. | = | + 60.50 m |
| F.T.L. | = | + 58.50 m |
| M.W.L. | = | + 59.20 m |
| General ground level | = | + 50.00 m |
| Stripped ground level | = | + 49.25 m |

**2. Earthen bund:**

Top width = 2.5 m

Side slopes = 2 horizontal to 1 vertical on both water face and rear face.

**3. Hearting:**

To width = 1.75 m

Side slopes = 1 horizontal to 1 vertical on both sides.

Top level = + 59.20 m (M.W.L.)

**4. Cut off trench:**

Bottom width = 2.5 m

Side slopes = 1:1 (both sides)

Bottom level = + 46.00 m

**5. Sand chimney:**

Thickness = 1.25m

Slope = 1:1 (parallel to side slope of hearting)

**6. Casting or horizontal casing or sand blanket:**

Thickness = 1.0 m and laid over longitudinal filter with its top level at + 51.40m

**7. Rock toe:**

Top level = + 52.20 m

Top width = 1.5 m out of total width 2.5m at the level + 52.20m

Side slopes = 1:1 on both sides.

Composition – Rock toe is filled with broken stones of varying size ranging from 200mm to 500mm on the earthen bund side, rock toe is provided with 150mm thick fine sand and below that 250mm thick coarse sand.

8. **Longitudinal filter:**

Bottom level of longitudinal filter is taken 400mm below stripped ground level (+48.85) in order to accommodate 250mm thick coarse and 150mm thick fine sand below that.

Stones of varying size from 250mm and 300mm are laid to a depth of 0.75m and same fine and coarse sand layers are laid over stones on which casing of 1.0m thick is provided

Bottom width = 1.5m with 1:1 side slopes and same size filter media is provided in the cross filter and extended into the rock toe.

9. **Toe drain:**

| | | |
|---|---|---|
| Bottom level | = | + 48.55 m |
| Bottom width | = | 1.0 m |
| Sides slopes | = | 1:1 on both sides. |
| Bed pitching and side revetment | = | 300mm thick rough stones are used. |

10. **Protection of upstream face of bund:**

The upstream face of bund is provided with 450mm thick rough stone revetment over 250mm thick gravel backing. This revetment is founded on rough stone toe wall 1.2m wide and 1.5m deep.

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