C09–C–**407**

3428

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2017

DCE—FOURTH 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. Sketch the cross-section of a pipe culvert with M-15 grade concrete bedding with the following data :

    Internal diameter of the pipe = 1·00 m

    Thickness of pipe = 0·10 m

    No. of pipes = 1

    Thickness of concrete bed = 250 mm

    Width of concrete bed = 1600 mm

    Thickness of concrete benching = 300 mm

2. Draw the cross-section of an abutment of an RCC bridge from the following data :

Abutment

Bottom level of CC foundation bed = + 79·60

Top level of CC foundation bed = + 80·10

Bed level = + 81·00

Bottom level of RCC slab = 83·75

Width of bed block = 600 mm

Thickness of bed block = 250 mm

Bottom width of abutment = 900 mm
(same width up to bed level)

Top width of abutment = 600 mm at bed lock level
with water face vertical

3. Draw the plan of septic tank from the given specifications :

Internal dimensions = 2750 mm × 900 mm × 1300 mm

Brick masonry wall thickness = 230 mm

CC offset for masonry walls = 300 mm

4. Draw the cross-section of a weir with stepped aprons.

5. Sketch the barrel of a tower head sluice from the following data :

Vent way = 0·90 m wide × 0·75 m deep

Width of barrel side wall = 0·5 mm at top and 0·75 m at bottom

CC foundation = 0·45 m thick with 0·3 m offset

RCC slab over barrel = 150 mm thick

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

(2) Any missing data may be assumed suitably.

6. Draw the following views of an RCC slab culvert to a scale of 1 : 50 with the given specifications :

(a) Half plan at bottom and half plan at top

(b) Sectional elevation

Specifications :

Foundations

Foundations for abutments and wing walls are taken to same level.
Bottom level of leveling coarse (CC) = + 49·80
Top level of leveling coarse = + 51·10
Width of leveling coarse = 1·5 m
Thickness of CC foundation bed = 0·5 m
Width of CC foundation bed = 1·5 m
Top level of CC foundation bed = bottom level of abutment
and wind wall = + 51·60
Bottom width of abutment = bottom width of
wing wall = 0·9 m
Bed level = + 52·60

Superstructure

Profile of abutments and wing walls = width of abutments wing walls is 0·9 m up to bed level. From bed level, water face is kept vertical and the rear (earth retaining side) side has a batter such that the width is equal to 0·6 m (at bed block level)
Thickness of the bed block = 250 mm
Width of bed block = 600 mm
Bottom level of RCC 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 = + 55·25
Length of abutments = 8·6 m
Width of roadway = 7·4 m
Length of wing wall = 2·8 m

Vent way and other protection works

Width of vent way = 2·0 m

Height of vent way = 1·6 m

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

Cut-off walls = cut-off walls 200 mm thick are provided at the ends of vent way

Top level of cut-off wall = BL = + 52·60

Bottom level of cut-off wall = + 52·00

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

Side slope revetment

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

7. Draw to a scale of 1 : 100, the cross-section of non-homogeneous earthen bund from the following specifications :

Specifications

TBL = + 45·7

MWL = + 44·50

FTL = + 43·60

Top width of bund = 3·0 m

General ground level at site = + 33·60

Stripped ground level = 33·10

Slope on water face = 2 in 1

Slope on rare face = 2·5 in 1

A berm of 1·8 m wide shall be provided at + 38·20 on rare side

Hearting zone

Top width = 1·8 m at MWL

Side slopes = 1 : 1

Sand chimney to a thickness of 1·0 m shall be provided on the rear face of hearting zone

Casing

Casing to a thickness of 900 mm is provided over longitudinal filter with its top at + 35·10

Cut-off trench

Bottom width = 3 m

Side slopes = 1 : 1 and taken to a level of + 28·60

Revetment

Revetment on water face consists of 450 mm size rough stone boulders layed over 150 mm thick gravel backing and is founded on rock wall 1·0 m wide and 1·2 m deep

Rock toe

Top width = 1·5 m at + 35·60

Side slopes = 1 : 1 and consists of rough stone boulders of size varying from 150 mm to 300 mm

Toe drain

1·0 m bed width with 1 : 1 side slopes. The bed level is at + 32·60, bed pitching and side revetment consisting of 300 mm rough stone

Longitudinal filter

Consists of rough stone of size varying from 150 mm to 250 mm to a depth of 750 mm. Fine and coarse sand layers of 150 mm thick and 200 mm thick are provided on both bottom and top of longitudinal filter. These sand layers shall be layed below stripped level at + 32·75, on which rough stones are arranged to form the filter media, arranged between sand layers. Bottom width = 2·50 m. Same arrangement shall be provided for cross-filter and extended into the rock toe.

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