1139

Code : 15CE55D

Register Number | | | | | | | | | | |

V Semester Diploma Examination, Nov./Dec.-2018

IRRIGATION & BRIDGE DRAWING

Time : 4 Hours] **[Max. Marks : 100**

Note : (i) Assume the missing data suitably

(ii) Drawing should be neat and fully dimensioned.

(iii) Answer any **one** question from **Q1** and **Q2**. **Q3** is compulsory.

1. (a) Details of an earthen bund across a stream are as follows : **15**

Top width of bund	– 2.5 m
R.L. of top of bund	– 83.00
M.W.L.	– 81.20
F.T.L.	– 80.60
Bed level of stream	– 75.00
Front side slope of bund	– 1.5 : 1
Rear side slope of bund	– 2 : 1

Puddle core-wall width at top 0.8 m and 2.3 m at bet level.

The puddle core-wall is taken down to RL – 73.00 with width of 1.5 m. Provide suitable revetment and gravel backing to the bund on U/S side and show longitudinal and cross drain.

Provide Grip trenches and saturation gradient line :

Draw to scale of 1 : 100

Cross section across Bund.

(b) The following are the details of a tank sluice with tower head

(i) <u>Hydraulic particulars :</u>

Sill level of sluice	R.L. – 44.20
F.T.L.	R.L. – 49.40
M.W.L.	R.L. – 50.00
T.B.L.	R.L. – 51.40

Hard soil available at RL – 43.60 for tower head and barrel portion.

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(ii) Bund :

Top width of bund – 2.0 m

Slopes U/S – 1.5 : 1

D/S – 2 : 1

(iii) Barrel :

Width – 0.75 m

Clear height – 0.60 m

Side wall – Top width – 0.45 m

Bottom width – 0.60 m

Bed concrete with 0.20 m offsets

Wearing course thickness – 0.10 m

RCC roof slab thickness – 0.20 m

(iv) Tower head :

Inner dia. – 1.50 m

Thickness of side wall – 0.45 m

Height of tower head above M.W.L. – 0.30 m

(v) Cistern :

Inner dimension – 3 m × 3m

Thickness of side wall – 0.45 m

Bed concrete thickness with offset alround of 0.20 m

(vi) Wing walls :

Splay – 1 : 6

Top width – 0.45 m

Rolled steel plate 5 mm thick and 0.8 m × 1.0 m is used as shutter with 30 cm dia. Connecting rod. Provide suitable revetment, gravel backing and guide slabs.

(vii) Feeder channel :

Base width – 1.0 m

Bund side slope – 1.5 : 1

Full supply depth – 0.6 m

Top width of bank – 1.0 m

Draw the following views to a scale of 1 : 100.

(a) Half plan at top & half plan at bottom 20

(b) Longitudinal section along centre line of barrel. 15

2. Following are the details of Tank weir with water cushion :
Top Bund level R.L. – 106.00
Maximum water level R.L. – 105.20
Full Tank level R.L. – 104.50
Ground level R.L. – 102.00
U/S slope of bund – 1.5 : 1
D/S slope of bund – 2 : 1
Top width of bund – 2.0 m

Body wall :
Top width of body wall – 1.0 m
Bottom width of body wall – 2.0 m
Top level of foundation concrete – 101.00
Bottom level of foundation concrete – 100.40
Depth of water cushion – 1.0 m
Length of Horizontal solid apron at R.L. – 101.00 – 4.0 m
Slope of solid apron beyond horizontal apron – 1 in 4
Splay of wing wall on U/S – 1 in 3.
Splay of wing wall on D/S – 1 in 5
Splayed wing wall top width – 0.5 m
The batter of 1 in 8 is to be provided on water side.
Abutment :
Top width – 0.5 m at R.L. – 106.00
Bottom width – 2.0 m
The batter of 1 in 8 is to provided on water side.
Provide suitable bed concrete for wing walls, return walls and cutoff wall.

Return walls U/S :
Top width – 0.5 m at R.L. – 104.80
Bottom width – 1.0 m
The batter of 1 in 8 is provided on water side.

Return walls D/S :
Top width – 0.5 m at R.L. – 103.00
Bottom width – 1.0 m
A batter of 1 in 8 is to be provided on water side.
Provide suitable cutoff wall.
Provide grouted apron 0.3 m thick to a length of 2.5 m.
Draw to a scale of 1 : 100 the following views :

(a) Cross section across body wall. **20**
(b) Half plan at top and half plan at foundation. **20**
(c) Half front elevation and half sectional elevation. **10**

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3. Following are the details of T-beam slab bridge proposed to be constructed across a stream.

Bed level of stream R.L. – 200.00
Bed width of stream – 2300 m
Ground level at site R.L. – 206.00
High flood level R.L. – 205.50
Road formation level R.L. – 208.00
Hard rock level R.L. – 198.00
Span width – 10.0 m
No. of span – 2
Width of road between kerb – 7.5 m
Width of kerb – 1.25 m on either side
Thickness of kerb – 25 cm
Thickness of RCC parapet – 10 cm
Height of parapet from road level – 80 cm
No. of T-beams – 5 Nos. at 2 m c/c.
Depth of rib – 0.9 m
Width of rib – 0.4 m
Thickness of RCC slab – 20 cm
Thickness of wearing course – 10 cm
Bearing slab thickness – 15 cm

Abutment :

S.S.M. with top width – 1.2 m with vertical front face. Back batter – 1 : 8.

Pier :

S.S.M. with top width – 1.5 m with side batter – 1 : 20. Provide semicircular cut and ease water ends.

Wing walls :

Return wing wall, top width 0.6 m front face vertical and back batter 1 : 10.
Side slope of stream – 1 : 1
Side slope of Embankment – 1.5 : 1
Rough stone pitching of thickness 30 cm has to be provided for the stream on U/S and D/S.
Draw to a scale of 1 : 100 the following views :

(a) Half longitudinal section and half longitudinal elevation. **25**
(b) Half plan at top and half plan at foundation. **25**