1028

Code : 15CE55D

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

V Semester Diploma Examination, Oct./Nov.-2019

IRRIGATION AND BRIDGE DRAWING

Time : 3 Hours] **[Max. Marks : 100**

Note : (i) Assume the missing data suitably.
(ii) Answer any **one** question from Q1 & Q2.
(iii) Q. No. 3 is compulsory.

1. (a) Draw to a scale of 1 : 100 a typical cross-section of an earthen bund with masonry core wall, with the following details. : **15**

Top width – 2.0 m

U/s slope of bund – 1½ : 1

D/s slope of bund – 2 : 1

R.L. of top of bund – 108.00 m

R.L. of M.W.L. – 106.00 m

R.L. of F.T.L. – 105.40 m

R.L. of Bed – 100.00 m

R.L. of top of masonry core wall is at M.W.L.

Top width of core wall – 0.60 m

Side slopes of core wall – 1 : 8

Hard rock is available at RL 98.00 m.

Provide rough stone rivetment of 0.50 m thick and gravel backing of 0.15 m thick with suitable foundation.

Provide horizontal filter and draw saturation gradient line of slope 3 : 1 upto core wall and 4 : 1 from the core wall.

(b) The following are the details available for tank sluice Head and Gibbet wall type with slabbed barrel and plug arrangement.

Bed level at site – RL 200.00 m

F.T.L. – R.L. 203.00 m

M.W.L. – R.L. 203.70 m

[Turn over

Top level of Head wall – R.L. 204.00 m

Top of bund level R.L. 205, 50 m

Top width of Head wall – 0.50 m

Length of Gibbet wall – 0.75 m

Top width of Gibbet wall and wing wall – 0.5 m

Bottom width of Gibbet wall – 1.2 m

Bottom width of wing wall at junctions with Gibbet wall – 0.9 m

Plug chamber – 0.60 m × 0.60 m × 0.45 m high

Barrel width – 0.6 m

Thickness of slab over tunnel is 0.15 m

Abutment :

Top width – 0.60 m

Bottom width – 0.75 m

Height – 0.6 m

Rear cistern size 1.2 m × 1.2 m

Side walls :

Top width – 0.45 m

Bottom width – 0.60 m

Cement concrete bed below all masonry constructions – 0.60 m

Offsets – 0.15 m

Splay of wing wall – 15°

(i) Design the diameter of plug hole with a minimum head of 200 mm to get maximum discharge of 0.2 m^3/sec in canal. **05**

(ii) Draw longitudinal section. **15**

(iii) Draw half to plan and half bottom plan. **15**

Draw above views to a scale of 1 : 50.

2. The following are the details of surplus weir with stepped apron :

Top width of Bund – 3.00 m

U/s slope of bund – 1½ : 1

D/s slope of bund – 2 : 1

R.L. of top of bund – 35.00 m

R.L. of ground level – 30.50 m

F.T.L. – 32.40 m

M.W.L. – 33.00 m

Body wall :

S.S. Masonry

Top width at FTL – 2.4 m

Bottom width at R.L – 29.60 m is 3.0 m (both side battered)

A concrete bed of 0.60 m thick with 0.3 m offsets.

Provide dam stones 0.15 m × 0.15 m × 0.6m @ 0.6 m c/c.

Length of weir – 35 m

Solid aprons of concrete 2 Nos of 4.5 m length including 0.6 m wide stone masonry. Curtain walls at R.L. 31.60 m, 30.80 m. Thickness of 1st solid apron is 0.8 m and 2nd solid apron is 0.5 m. Curtain walls are 0.60 m wide and 1.3 m deep on a concrete bed of 0.3 m thick and 0.9 m wide.

Rough stone apron : 0.50 m thick 5.0 m long beyond the solid apron at R.L. 30.00 m.

Wing walls – Splay U/s 3 : 1, D/s 5 : 1, Top width – 0.5 m

Back face vertical. Front face batter of 1 : 8 and slope along with bund.

Abutment – Top width 0.50 m, Back face vertical front face batter of 1 : 8.

Return wall – Top width – 0.50 m, Top level of return wall at U/s is 31.5 m and D/s is 30.50 m.

Draw to the scale of 1 : 50 the following views :

(i) Cross-section across body wall. **20**

(ii) Half plan at top and half plan at foundation. **20**

(iii) Half longitudinal section and half longitudinal elevation. **10**

3. A T-Beam deck slab bridge of two span across a stream has the following details :

Span width – 10.00 m

Bed level of stream – R.L. 100.00 m

H.F.L. – R.L. 103.00 m

Bank level – R.L. 104.00 m

Hard rock level – R.L. 98.00 m

Width of stream – 21.00 m

Road formation level – R.L 107.00 m

Side slope of stream – 1 : 1

Width of beam at Bank level is 1. 0 m

Road width – 7.5 m

Kerb on both sides – 0.15 m × 0.15 m

Width of footpath on both side is 1.25 m

Width of parapet – 0.45 m

Thickness of R.C.C. slab is 0.2 m

Depth of Beam – 0.8 m

Width of Beam – 0.5 m

No. of ribs 5 Nos. at 2 m c/c with equal overhanging on both sides.

Pier details :

Size stone masonry

Width of Pier – 1.0 m

Both sides of pier vertical

U/s cut water end

D/s ease water end

Abutment details :

Size stone masonry

Top width – 1.2 m

Bottom width at R.L 97.00 m is 2.2 m

Wing wall details :

Size stone masonry

Return type wing wall

Top width – 0.5 m

Bottom width – 1.5 m

Foundation details for Pier,

Abutment & wing wall –

Depth of C.C. bed is 1.0 m

Provide 0.4 m c.c. bed projection

Parapet details :

Size stone masonry posts on the abutment and per 0.3 m × 0.3 m size

R.C.C. posts 2 Nos in between masonry posts with pipe railing size 0.1 m × 0.1 m (R.C.C. Post)

Height of parapet – 0.75 m

C.C. coping on posts 0.15 m

Draw to a suitable scale the following views :

(i) Half longitudinal section and half elevation. 25

(ii) Half plan at top and half plan at foundation. 25