1139

Code : 15CE55D

Register Number | | | | | | | |

V Semester Diploma Examination, April/May-2018

IRRIGATION AND BRIDGE DRAWING

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

Instructions : (i) Answer any **one** of full question from Part – **A** & Part – **B** is compulsory

(ii) Assume the missing data suitably.

(iii) Drawing should be neat & fully dimensioned.

PART – A

1. (a) Draw the cross section of an earthen bund with core wall to suitable scale for the following details.

Top width of bund	:	3.0 m
R.L. of top of bund	:	303.00 m
R.L. of MWL	:	301.500 m
R.L. of FTL	:	300.500 m
R.L of bed level of stream	:	295.00 m
U/s slope	:	1½ : 1
D/s slope	:	2 : 1
Top level of puddle core wall	:	301.50 m
Top width of puddle core wall	:	0.8 m
Width of core wall at bed level	:	2.5 m

Width of puddle core wall at R.L. 293.00 m is 1.5 m.

Provide rough stone revetment of 0.5 m thick over 150 mm thick gravel backing with suitable right – angled grip trenches below bed is 1 m and slope and saturation line is 4 H to 1 V in casing and 2 H to 1 V in core wall and also show drainage arrangement and rock toe. **15**

(b) The following are details of tank sluice :

Top width of bund	–	2.0 m
Front slope of the bund	–	1.5 : 1
Rear slope of the bund	–	2 : 1
RL. of the top of bund	–	403.0 m
RL. of MWL	–	402.0 m
RL. of FTL	–	401.50 m
Sill level of sluice	–	398.0 m
Top width of head wall	–	0.6 m
Bottom width of head wall	–	1.2 m
Top width of gibbet wall	–	0.5 m
Length of gibbet wall	–	0.75 m
Thickness of c.c. bed	–	0.5 m
Plug chamber	–	0.6 m × 0.6 × 0.45 m
Diameter of plug hole	–	200 mm
Guide slab is provided at 1 m c/c		
Size of the Rear Cistern	–	1.8 m ×1.8 m
Top width of Cistern wall	–	0.5 m
Bottom width of Cistern wall	–	0.6 m
Cistern opening width	–	0.75 m
Size of arched barrel	–	0.6 m × 0.8 m
Arch thickness	–	0.2 m
Top width of barrel wall	–	0.5 m
Bottom width of barrel wall	–	0.6 m
Top width of wing wall	–	0.5 m & splayed at 1 in 8

Draw to a suitable scale, the following views :

(i) Longitudinal section through pipe vent. **20**

(ii) Half plan at top and half plan at foundation. **15**

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

Top level of bund	–	503.0 m
Bed level of bund	–	499.0 m
Crest level of weir	–	501.50 m
Max. water level	–	502.30 m
Hard rock level	–	498.00 m
Top width of the bund	–	2.0 m
Upstream side slope	–	1.5 : 1
Downstream side slope	–	2 : 1
Top width of the weir wall	–	1.0 m

Bottom width of the weir at RL 498.50 m with equal side slope	–	1.6 m
C.C. bed below weir wall	–	0.5 m
Top width of wing wall	–	0.5 m
Bottom width of the wing wall at junction of abutment	–	1.2 m
Top width of abutment	–	0.5 m
Bottom width of abutment	–	1.2 m

Upstream wing wall splayed at 1 in 3 have return of 2.5 m length at 500.5 m, top width of return wall is 0.5 m and its bottom width is 1.0 m with front face vertical.

Downstream wing wall splayed at 1 in 5 upto toe point.

Length of the solid apron at RL – 499.75 m is 3.5 m including 0.5 m wide cut off wall.

Length of the rough stone apron at RL 499.0 m is 3 m including 0.5 m wide cutoff wall.

Thickness of solid and rough stone apron is 0.5 m.

Combined catchment area – 18 km^2.

Intercepted catchment area – 14 km^2.

Ryve's co-efficient for combined Catchment is 9.00

Ryve's co-efficient for intercepted catchment is 1.80.

(i) Calculate the length of the weir. Draw to a suitable scale, the following views. **5**

(ii) Cross section at centre of weir. **20**

(iii) Half plan at top and Half plan at foundation. **25**

PART – B

3. T-beam slab bridge of RCC of two spans is to be constructed across on irrigation canal with the following details.

Canal details :

Bed width of the canal	–	12.0 m
Bed level of the canal	–	300.0 m
Top level of bank	–	304.50 m
Full supply level	–	304.0 m
Hard rock level	–	298.0 m
Bank slope	–	1 : 1

Road details :

Road level	–	306.50 m
Thickness of wearing coat	–	0.1 m
R.C.C. beam	–	0.4 m × 0.8 m

Number of beams	–	5 Nos. @ 1.6 m c/c
Deck slab	–	0.2 m
Road width	–	6.0 m
Foot path on both side	–	1.2 m
R.C.C. parapet wall	–	0.2 m thick
Height of parapet wall above the kerb	–	1 m
Kerb depth	–	0.2 m

Abutment : Top width 1.20 m and bottom width 2.0m with front face vertical.

Pier – Top width 1 m with vertical face.

Wing walls are splayed at 45° with front face vertical, top width – 0.5 m with back batter 1 in 6.

Return walls are provided at the end of wing wall for a length 2 m.

Reinforcement consists of 8 bars of 25 m diameter in two rows.

Two bars are bent up at 1 m and other two bars are bent up at 1.6 m from the face of support. Two bars of 16 mm diameter are used as hanging bars and 8 mm diameter. Stirrups at 200 mm c/c are provided.

Abutment & Pier cap of R.C.C. 0.3 m thick with 0.1 m projection at RL. 305.10 m.

Draw the following views to a suitable scale.

(i) Half longitudinal elevation and Half longitudinal section. **20**

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

(iii) Cross section through centre of span. **10**