

Code: 9A01802

R09

B.Tech IV Year II Semester (R09) Advanced Supplementary Examinations, July 2013

DESIGN AND DRAWING OF IRRIGATION STRUCTURES

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Answer any ONE question
All questions carry equal marks

- 1 (a) Design a sluice taking off from a tank irrigating 300 hectares at 900 duty. The tank bund through which the sluice is taking off has a top width of 2.0 m. With 2:1 side slopes. The top level of bank is + 50.00 and the ground level at site as + 44.00. Good hard soil for foundation is available at + 33.00. The sill of sluice at off take is + 44.50. The maximum water level in tank is + 48.50. The full tank level is + 47.50. Average low water level of the tank is + 45.50. The details of the channel below the sluice are as under:

Bed level + 44.50
F.S.L + 45.00
Bed width 1.25 mts

Side slopes $1\frac{1}{2}$ to 1 with top of bank at + 46.00.

- (b) Draw the following to a suitable scale:
(i) Half plan at top and half plan at foundation.
(ii) Longitudinal section.
- 2 (a) Design a canal regulator cum road bridge with the following data:

| Hydraulic particulars of the canal | U/S of regulator | D/S of regulator |
|------------------------------------|----------------------|----------------------|
| Full supply discharge | 20 m ³ /s | 16 m ³ /s |
| Bed width | 15 mts | 15 mts |
| Bed level | + 20.00 | + 20.00 |
| Full supply depth | 2.00 mts | 1.75 mts |
| F.S.L | + 22.00 | + 21.75 |
| Top level of bank | + 23.00 | + 22.75 |

The right bank is 5 mts wide and left bank is 2.0 mts wide. Top widths of banks are same in the D/S of the regulator as that of U/S of the regulator. The regulator carries a road way single lane designed for I.R.C loading class 'A'. Provide clear free board of 1.0 m above F.S.L for the road bridge. Good foundation soil is available at + 19.00. Assume the ground level at site as + 22.00.

- (b) Draw the following to a suitable scale:
(i) Half plan at top and half plan at foundation.
(ii) Section through regulator vent.
