

R09

Code: 9A01802

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

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- 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 <sup>3</sup> /s	16 m <sup>3</sup> /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.

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