

Code: 9A01802

R09

B.Tech IV Year II Semester (R09) Advanced Supplementary Examinations June/July 2016

DESIGN & DRAWING OF IRRIGATION STRUCTURES

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Answer any ONE question
All questions carry equal marks

- 1 Design a regulator-cum-road bridge with the following data:

Hydraulic particulars of canal:

	u/s	d/s
Full supply discharge –	20 m ³ /s	16 m ³ /s
Bed width	- 15 m	15 m
Bed level	- +20.00	+20.00
F.S depth	- 2.00 m	1.75 m
F.S.L	- +22.00	+ 21.75
Top level of bank	- 23.00	+ 22.75

The right bank is 5 m wide and left bank is 2 m wide at upstream. Top widths of banks at the downstream side are same as those on the upstream side. The regulator carries a road way single lane designed for I.R.C loading class 'A'. Provide clear freeboard of one meter above F.S.L for the road bridge. Good foundation soil is available at +19.00. Assume the ground level site as +22.00. Also draw the plan, longitudinal and cross section.

- 2 Design the surplus work of a tank forming part of a chain of tanks. The combined catchment area of the group of tanks is 25.89 sq.km and the area of the catchment intercepted by the upper tanks is 20.71 sq.km. It is decided to store water in the tank to a level of +12.00 m above M.S.L limiting the submersion of foreshore lands up to a level of +12.75 m above M.S.L. The general ground level at the proposed site of work is +11.00 m, and the ground level below the proposed surplus slopes off till it reaches +10.00 m in about 6 m distance. The tank bund has a top width of 2 m at level +14.50 with 2.1 side slopes on either side. The tank bunds are designed for a saturation gradient of 4:1 with 1 m clear cover. Provisions may be made to make Kutcha regulating arrangements to store water up to M.W.L at times of necessity. The foundations are of hard gravel at a level of 9.5 m near the site of work. Also draw the plan & cross section.
