

Code: CE7T1

**IV B.Tech - I Semester – Regular Examinations – November 2015**

**DESIGN AND DRAWING OF HYDRAULIC  
STRUCTURES  
(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Answer any **ONE** full question.

Note: Assume any other data if required, Khosla's curves and  
Blench Curves are allowed

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**1. Design and draw (Plan and Elevation only) a regulator-cum-road bridge with the following data:**

***(a) Hydraulic particulars of canal upstream.***

Full supply discharge : 20 cumecs

Bed width = 15 m.

Bed level = +20.00.

F.S.L. = +22.00.

Top level of bank = 23.00.

The right bank is 5 meters wide and Left bank is 2m wide.

***(b) Hydraulic particulars of canal downstream***

Full supply discharge = 16 cumecs.

Bed width = 15 m.

Bed level = +20.00.

F. S. L. = +21.75.

Top level of bank = +22.75.

Top widths of bank are the 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 free board of one meter 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.

**2. Design and draw (plan and Longitudinal section of barrel.) a Type-III siphon Aqueduct with the following hydraulic data.**

***(a) Hydraulic Particulars of Canal:***

Discharge : 35 cumecs

Bed width : 20 m

Bed level : +40.00

Full Supply level : +42.00

Ultimate Bed level : +39.75

Ultimate F S L : +42.50

Mean Velocity of flow in the canal: 0.83 m/s

Left bank top width: 5m

Right bank top width: 2 m

Top of bank level: +43.50

***(b)Hydraulic Particulars of Drain***

Catchment area : 8 km<sup>2</sup>

Average bed level of drain : +38.00

M F L of the natural drain at the site of the work: +39.75

Hard soil is available below : +37.00

Assume C=15 in Ryve's formula.