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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech IV Year II Semester Regular Examinations September 2020

DESIGN AND DRAWING OF IRRIGATION STRUCTURES

(Civil Engineering)

Time: 3 hours

Max. Marks: 60

(Answer any one of the following **1 x 60 = 60** Marks)

- 1** Design a surplus weir for a minor tank forming a group of tanks with the following data: **60M**

Combined catchment area = 30.45 km²

Intercepted catchment area = 24.85 km²

Top width of the bund = 2 m

Side slopes of the bund = 2:1 on both sides

Top level of bund = + 14.50

Maximum Water Level (MWL) = + 12.75

Full Tank Level (FTL) = + 12.00

General ground level at the site = + 11.00

Ground level slopes off to a level = + 10.00 in about 6 m distance

The foundations are of hard gravel = + 9.50

Saturation gradient = 4:1 with 1 m clean cover

Provision is to be made to store water up to MWL in-times of necessity

Draw the following:

- a) Half plan at top and half plan at foundation level
- b) Half longitudinal section and half longitudinal elevation
- c) Section across weir

OR

- 2** Design a regulator cum Road Bridge with the following data: **60M**

Hydraulic particulars of canal upstream

Full supply discharge = 18 m³/s

Bed width = 14 m

Bed Level = + 15.00

Full Supply Depth = 2.0 m

F.S.L = + 17.00

Top level of bank = + 18.00

The right bank is 5 m wide and left bank is 2 m wide

Q.P. Code: 16CE140Hydraulic particulars of canal downstream :

Full supply discharge = $12 \text{ m}^3/\text{s}$

Bed width = 14 m

Bed Level = + 15.00

Full Supply Depth = 1.60 m

F.S.L = + 16.60

Top level of bank = + 17.60

Good foundation soil is available at = + 14.00

The general ground level at site = + 17.00

Top width of banks is the same as those on the upstream side. The regulator carries a road way single lane designed for IRC loading class 'A' provides clear free board of one meter above F.S.L. for the road bridge.

Draw the following to a suitable scale:

- a) Plan
- b) Half sectional elevation
- c) Cross section

*** END ***