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10CV65

Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Hydraulic Structures and Irrigation Design Drawing

Time: 4 hrs. Max. Marks:100

Note: 1. ***Answer any TWO full questions form PART A and ONE question from PART B***
2. ***Draw neat diagram wherever necessary***
3. ***Missing data may suitably be assumed.***

PART – A

1 a. Define: i) Yield, ii) Trap efficiency iii) Density currents. **(03 Marks)**

b. The construction cost for certain possible heights of dam at a given site have been estimated and are given in table, along with storage capacity at these heights. Determine the most economical height of dam :

Height (m)	10	20	30	40	50	60	65
Construction cost (million Rs.)	4	8	12	18	27	39	50
Storage (million cum)	50	110	180	250	350	500	600

(05 Marks)

c. Explain briefly environmental effects of construction of a reservoir. **(07 Marks)**

2 a. What are the modes of failure of gravity dam? Explain. **(07 Marks)**

b. Design the practical profile of a gravity dam of stone masonry, given the following data :

RL of base of dam = 1250.00m
RL of FRL = 1280.00m
Height of wave = 1.5m
Safe compressive strength = 1200kN/m^2
Specific gravity = 2.4
Sketch the profile. **(08 Marks)**

3 a. List the design criteria for earth dams. **(07 Marks)**

b. Explain the steps in fixing the preliminary dimensions of an earth dam. **(08 Marks)**

PART – B

4 Design a surplus weir with stepped apron of a tank with the following details :

Catchment area = 20km^2
Maximum water level = 124.000m
Full tank level = 123.000m
Ground level at weir site = 122.000m
GL below proposed weir upto a reach of 5m = 121.000m
Tank bund level = 125.500m
Top width of tank bund = 2.0m
Side slopes of bund on either side = 2H:1V
Hard foundation available at 120.000m
Ryve's coefficient = 9
Hydraulic gradient = 1:5

(25 Marks)

Draw to a suitable scale :

a. Half plan at top and half plan at foundation. **(20 Marks)**
b. Half elevation and half sectional elevation. **(15 Marks)**
c. Cross section across the weir. **(10 Marks)**

5 Design details of a canal regulator is as follows :

Particulars	u/s	d/s
Full supply discharge	$16m^3/s$	$13m^3/s$
Bed width	10m	10m
Full supply level	12.000m	11.500m
Top level of Bank	13.000m	12.500m
Canal bed level	10.000m	10.000m
Top width of bank	2m	2m
Canal side slopes	2H:1V	2H:1V

Bligh's coefficient = 10
General GL at the site = 12.00m
Good soil for foundation is at 9.000m
Design Ventway, Gates, Apron, and Protection works. **(25 Marks)**
Draw to a suitable scale:

a. Half plan at top and half plan at foundation. **(20 Marks)**
b. Half elevation and half sectional elevation. **(15 Marks)**
c. Sectional elevation through regulator vent. **(10 Marks)**

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