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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 from 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

- 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/m²
 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 = 20km²
 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 :

- Half plan at top and half plan at foundation. (20 Marks)
- Half elevation and half sectional elevation. (15 Marks)
- 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:

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

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