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Sixth Semester B.E. Degree Examination, June/July 2017
Hydraulic Structures and Irrigation Design Drawing

Time: 4 hrs.

Max. Marks:100

Note: 1. Answer any TWO questions from Part-A and ONE full question from Part-B.
2. Missing data, if any, may be suitably assumed.

PART - A

- 1 a. What is reservoir sedimentation? Explain with neat sketch. Also discuss various methods of reservoir sediment control. (07 Marks)
- b. Briefly explain the procedure for determining the storage capacity and yield of a reservoir using mass curve. (08 Marks)
- 2 a. Explain the various modes of failure of gravity dam and mention their remedies. (07 Marks)
- b. Design the practical profile of a gravity dam of stone masonry given the following data :

R.L. of base of dam	= 1450m
R.L. of F.R.L.	= 1480.5m
Specific gravity of the masonry	= 2.4
Safe compressive stress for masonry	= 1200 kN/m ²
Height of waves	= 1m.

 (08 Marks)
- 3 a. Explain the method of plotting phreatic line for an earth dam with horizontal filter at downstream. (07 Marks)
- b. For a homogeneous earth dam 52m high, and 2m free, board a flow net was constructed and following results were obtained.

Number of potential drops	= 25
Number of flow channels	= 04

 The dam has a horizontal filter of 40m length at its d/s end. Calculate the discharge per meter length of the dam if the coefficient of permeability of the dam is 3×10^{-3} cm/sec. (08 Marks)

PART - B

- 4 Design the surplus work of a tank forming part of a chain of tanks.

Combined catchment area	= 25.89 sq.km
Intercepted catchment area	= 20.71 sq.km
Maximum water level	= + 12.75
Full tank level	= + 12.00
Ground level at proposed site	= + 11.00
Ground level below proposed	
Weir up to a reach of 6m(Fall)	= + 10.00
Top width of tank bund	= 2.00m
Tank Bund Level (TBL)	= +14.50
Side slopes of bund on either side	= 2 : 1
Design saturation gradient (HGL)	= 4 : 1
Level of hard strata	= + 9.50
Ryve's coefficient for combined catchment	= 9
Ryve's coefficient for intercepted catchment	= 1.5

 Provision may be made to make kutchra regulating arrangements to store water up to MWL in times of necessity. (25 Marks)

Draw :

 - a. Half plan at foundation and half plan at ground level. (20 Marks)
 - b. Draw half longitudinal section and half longitudinal elevation. (15 Marks)
 - c. Cross section across surplus weir. (10 Marks)



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- 5 Design (Hydraulic design only) a suitable cross-drainage work given the following data at the crossing of a canal and a drainage.

Canal :

Full supply discharge	= 32 cumes
Full supply level	= + 213.5
Canal bed level	= + 212.0
Canal bed width	= 20
Trapezoidal canal section with 1.5H : 1V slopes	
Canal water depth	= 1.5m

Drainage :

High flood discharge	= 300 cumes
High flood level	= 210.0m
High flood depth	= 2.5m
General ground level	= 212.5m.

(25 Marks)

Draw :

- Plan showing all details.
- Longitudinal section.
- Cross section showing all details.

(20 Marks)

(15 Marks)

(10 Marks)

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