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10CV65

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 kutcha 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)**

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

<u>Canal :</u>

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

<u>Drainage :</u>

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

(25 Marks)

Draw :

a. Plan showing all details.   **(20 Marks)**

b. Longitudinal section.   **(15 Marks)**

c. Cross section showing all details.   **(10 Marks)**

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