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SE-7341

B. E. (Sem VII) (Civil) Examination

April / May – 2011

Irrigation Engineering - II

(Old Syllabus)

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. (Sem - 7)**

Name of the Subject :

☛ **Irrigation Engineering - 2**

☛ Subject Code No. : **7 3 4 1** ☛ Section No. (1, 2,.....) : **1, 2**

Seat No. :

Student's Signature

SECTION - I

1 (a) Enlist the major and minor forces acting on the gravity dam. Explain the uplift pressure and the silt pressure. **5**

(b) Explain the multiple step design of gravity dam. **7**

(c) Develop an expression for base width of elementary profile of gravity dam from **8**

(i) stress criterion, (ii) sliding criterion.

2 (a) Enlist the various preventive and remedial methods with the help of which reservoir sedimentation control can be done. Explain. **5**

(i) Proper designing and reservoir planning

(ii) Removal of sediment deposit.

(b) (1) Define 'Trap Efficiency' and capacity inflow ratio. **2**

(2) Draw propotionate sketch to show the variation between capacity inflow ratio and sediment trapped percent. **2**

(3) List the steps to calculate the life of reservoir.

OR

(3) Explain the use of mass curve method to find the capacity of reservoir.

3 Write short notes on any **three** of the following : **15**

(1) Density currents and reservoir sedimentation.

(2) Provision of galleries and ducts in gravity dam and their function.

(3) Reservoir losses and control of evaporation losses.

(4) Lost apportionment of multipurpose reservoir

SECTION - II

Instructions : (1) Figures to the right indicate full marks.

(2) Assume missing data suitable and state them clearly.

4 (a) Discuss the criteria for safe design of earthen dam. **5**

(b) What are the various types of spillway gates. Briefly describe their working. **8**

5 (a) Calculate discharge over an Ogee-weir with coefficient of discharge equal to 2.0 at a head of 2.5 m. The length of the spillway is 120 meters. The weir crest is 6 meters above the bottom of the approach channel having same width as the spillway. **6**

(b) Define jump height curve and tail water curve. Discuss briefly various types of energy dissipation below overflow spillways for different relative positions of jump height curve and tail water curve. **10**

OR

5 (a) An earthen dam of uniform material has following cross section : **10**

Shape	:	Trapezoidal
Top width	:	6.0 m
Freeboard	:	3.0 m
U/S slope	:	4 : 1
d/s slope	:	3 : 1

Total height of dam is 21.0 m. Draw phreatic line if dam is constructed with horizontal filter of 27.0 m length at the toe, starting from toe. Assume the coefficient of permeability of soil material as 5×10^{-4} cm/sec. to find seepage per unit length of the dam.

(b) Explain method of construction of earthen dam. **6**

6 Write short notes on following : (any **four**) **20**

(1) Objectives and methods of river training
(2) Low head hydropower plants
(3) Causes of meandering
(4) Levees
(5) Failure of earthen dam due to piping.
(6) Selection of spillway type.
