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# RN-7341

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

**May / June – 2010**

## Irrigation Engg. - II

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) (Civil)**

Name of the Subject :

☛ **Irrigation Engg. - 2**

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

Seat No. :

Student's Signature

(2) Figure to the right indicate full marks.

(3) Draw sketchs wherever necessary.

(4) Assume missing data suitably with appropriate remarks.

**1** (a) Explain uplift pressure, silt pressure and wind forces acting on gravity dam. Enlist the other forces. **7**

(b) Draw a profile of the gravity dam section with the following data. **8**

Top width - 7 metres
Base width - 65.1 metre
Free board - 1 metre
u/s face - vertical
d/s slope 0.7 horizontal to 1 vertical
d/s slope starts at 7m from the top. There is no tail water, no drainage gallery is to be considered. Find the factor of safety against overturning considering hydrostatic, uplift and self weight forces. Find the factor of safety, reservoir full condition.

**2** (a) Explain briefly the various methods and steps taken to control sediment deposition in reservoir. **8**

**OR**

(a) Draw the trap efficiency and capacity inflow ratio curve for determination of life of reservoir. Explain the procedure for calculation of life of reservoir.

(b) (i) Explain the functioning of a flood control reservoir drawing suitable hydrograph. **7**

(ii) Explain how the capacity of a storage reservoir determined using trapezoidal and core formula with the help of enclosed area of contours.

**3** (a) Explain elementary profile of a gravity dam. Obtain the base width using the stress criteria. **6**

**OR**

**3** (a) Explain low and high gravity dams. Obtain an expression for the limiting height of a low gravity dam. **6**

(b) Draw suitable sketches, explain galleries and shafts in a gravity dam.

(c) Draw zoned earthen dam section, explain the various parts. Name the material you will recommend for a homogeneous dam.

## SECTION - II

**4** (a) Explain with neat sketch side channel spillway. Write advantages and disadvantages. **6**

(b) An ogee spillway with vertical u/s face has design discharge of 2000 cumecs, crest length of 200 m, normal reservoir level is 700.00 and average bed level is 650.00. Coefficient of discharge is 2.2. Determine the crest level and profile of overflow spillway section. **14**

**5** (a) For the earth dam of homogeneous section with a horizontal filter as shown in **Fig. 1**, draw the top flow line. If the coefficient of permeability of the soil material used in the dam is $5 \times 10^{-4}$ cm/sec. find the seepage flow per unit length of the dam. **9**

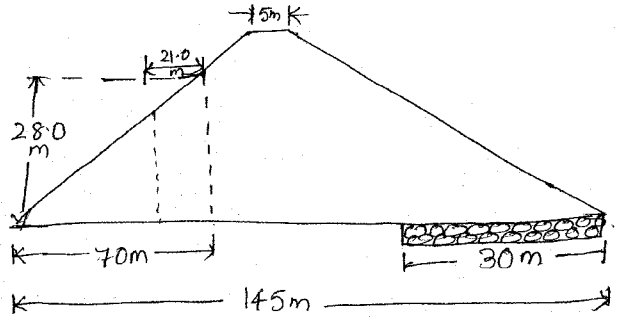


**Fig. 1**

(b) Write in detail about various types of Rock-fill earth dam. Show with neat sketches. **9**

**OR**

**5** (a) Classify spillways and write few lines about each type of spillway and show with neat sketches. **9**

(b) **Fig. 2** shows an ogee spillway which discharges water with a head of 1.2 m over the crest. Taking the coefficient of discharge as 2.2, compute the dynamic force on the curved section AB which has a constant radius of 3m. **9**

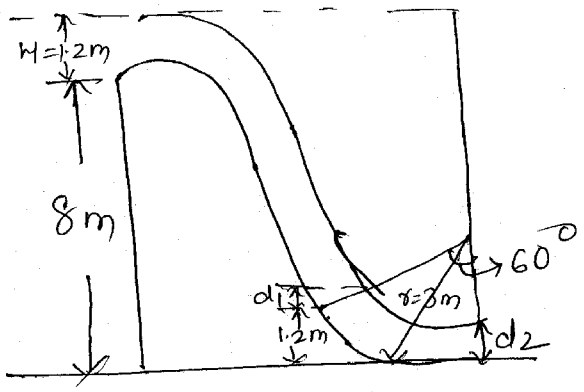


**Fig. 2**

**6** Write short notes on the following : (any three) **12**

(i) Objective of River training

(ii) Guide bank

(iii) Define " Penstock, turbine, draft tube, tail race

(iv) Distinguish between hydropower plant and thermal plant.

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