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ET-536(A)

00622

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

December, 2011

ET-536(A) : HYDRAULIC STRUCTURES-I

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any five** questions. All questions carry **equal** marks. Use of scientific calculator is permitted. Assume appropriate data if **not** given.*

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1. (a) What do you mean by reservoirs? Explain various types of reservoirs in brief. 7

(b) Briefly discuss the empirical relations for estimating sedimentation rate of Indian rivers. 7

2. (a) What do you mean by the arbitrary profile of a gravity dam ? Considering the effect of hydrostatic pressure and uplift pressure , show that the base width (b) of the arbitrary profile of the gravity dam for no tension to occur can be written as $b = \frac{h}{\sqrt{s - c'}}$ 2+5

(b) Describe briefly the foundation treatment for a rock fill dam 7

3. (a) What do you mean by hydraulic jump ? Explain its significance. 7

(b) Starting from the basic principles, show that the ratio of post jump depth (d_2) to pre jump depth (d_1) in a horizontal rectangular channel is given by $\frac{d_2}{d_1} = \frac{1}{2}\left[\sqrt{8F_1^2 + 1}\right]$ 7

4. (a) Briefly explain the salient features of Khosla's theory. How is it used in the design of permeable foundations ? 7

(b) What are different types of weirs ? Explain with neat sketches the circumstances under which each type is adopted. 7

5. (a) Explain in brief the various types of failures in earthen dams. 7

(b) Describe the needs and requirements of a spillway. 7

6. (a) Discuss the importance of seepage and leakage control in embankment dams. 7

(b) What is a divide wall ? Describe its functions. 7

7. Write short notes on the following : 4x3½=14

(a) Uplift Pressure

(b) Fish Ladder

(c) Storage Zoning

(d) Forces acting on gravity dams

8. Differentiate between the following : 4x3½=14

(a) Overflow and Non-overflow Dams

(b) Reservoir capacity and Reservoir Yield

(c) Diversion and Storage headworks

(d) Low gravity dam and High gravity dam