

**B.Tech. Civil (Water Resources Engineering)**

01435

**Term-End Examination**

**June, 2010**

**ET-536(A) : HYDRAULIC STRUCTURES-I**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any five questions. All questions carry equal marks. Support your answers with examples and neat diagrams, wherever necessary. Use of calculator is permitted. Assume appropriate data if not given.*

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1. (a) How will you distinguish a retarding reservoir from a detention reservoir ? What are their relative advantages and disadvantages ? 2+5=7
- (b) State the various investigations for locating suitable dam site. What are their relative importances ? 7
  
2. (a) Discuss the effect of earthquake in the design of gravity dam. 7
- (b) Compare and contrast foundation treatment with reference to gravity dam and earthen dam. 7

3. (a) What is an arbitrary section of a gravity dam and how would you design one such section ? 7
- (b) What are the types of failures in earth dams ? 7
4. (a) How will you test the stability of an earth dam constructed of cohesive soils ? 7
- (b) How is the reservoir operated for flood control ? 7
5. (a) What are the considerations for selecting the site for a headwork ? 7
- (b) Illustrate a typical layout of canal headwork including River Training Works. 7
6. (a) What are the considerations for designing a barrage ? 7
- (b) Discuss the Area-Velocity method for determining stream flow. 7
7. (a) Discuss the merits and limitations of various types of Spillways. 7
- (b) Discuss the different types of energy dissipaters provided downstream of a spillway. 7

8. Write short notes on *any four* of the following :

**4x3½=14**

- (a) Types of Dam
  - (b) Operating Policies of reservoirs
  - (c) Seepage and Leakage control in Dams
  - (d) Exit Gradient and Safe Exit Gradient
  - (e) Stilling Basin
  - (f) Reservoir sedimentation
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