No. of Printed Pages : 3

ET-536(A)

B.Tech. Civil (Water Resources Engineering)

00159

Term-End Examination

December, 2010

ET-536(A) : HYDRAULIC STRUCTURES-I

Time : 3 hours *Maximum Marks : 70*

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.*

1. (a) "Dams are the sources of sorrow and grief". Debate the statement giving points in favour as well as against it. 7

   (b) How would you determine the storage capacity of a reservoir with the help of mass curve of runoff, if a constant or a variable demand is known? 7

2. (a) Explain briefly with neat sketches the different forces that may act on a gravity dam. Indicate their magnitude, direction and locations. 5+2=7

   (b) Explain the purposes, functions and location of a drainage gallery in a dam. 7

3. (a) Explain how the following parameters affect design of an earth dam : **3x3=9**

(i) Optimum moisture content

(ii) C and ϕ value of soil; permeability of soil

(iii) Sudden draw-down of the reservoir

(b) How a reservoir is operated for flood control? **5**

4. (a) "A spillway is a safety valve in a dam". Discuss the statement. **5**

(b) What purpose is served by spillway gates ? What factors influence the selection of a particular type of spillway gate ? **5+4=9**

5 (a) Discuss briefly the various types of energy dissipaters that are used for energy dissipation below overflow spillway, under relative positions of T.W.C. and J.H.C. **7**

(b) Discuss with a neat sketch, the various storage zones of a reservoir. **7**

6. (a) What are the functions and design considerations of canal head regulators ? **7**

(b) Compare the various features of a weir and a barrage. **7**

7. (a) Why is seepage and leakage control an important aspect in embankment dams? 7

(b) What are the main causes of failure of weirs on permeable foundations and what remedial measures would you suggest preventing them? 7

8 Write Short notes on ***any four*** of the following. **4x3½=14**

(a) Joints in a gravity dam

(b) Types of failure of earth dam

(c) Reservoir operation

(d) Scouring Sluices

(e) Exit gradient

(f) Measuring Devices

(g) Reservoir sedimentation