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ET-536(A)

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B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2013

ET-536(A) : HYDRAULIC STRUCTURES-I

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions. All questions carry equal marks. Use of scientific calculator is permitted. Use appropriate data if found missing.*

1. (a) List different types of reservoirs. What do you understand by normal pool level, dead storage, live storage, and valley storage ? 5

   (b) What are the empirical relations for estimating sedimentation rates of Indian rivers ? 5

2. (a) What are the various factors to be considered in the selection of a dam site ? 5

   (b) Explain any two of the following: 2x2½=5

   (i) Rigid dams

   (ii) Non-rigid dams

   (iii) Trap Efficiency

3. (a) List the various forces acting on a dam ? What are the static and dynamic forces on a dam ? 5

(b) How is the water pressure accounted for in the non-overflowing dam and spillway portion of the dam ? 5

4. (a) What is an arbitrary section of a gravity dam ? How would you design such a section ? 5

(b) What are the causes of failure of a gravity dam ? 5

5. (a) Discuss the various types of failures in earth dam in brief. 5

(b) How will you test the stability of an earth dam constructed of cohesive soils ? 5

6. (a) What do you understand by "full reservior capacity" ? 5

(b) Explain ***any two*** of the following in the reservior planning and operation: 5

(i) Conservation zone

(ii) Flood control zone

(iii) Spill and surcharge zone

7. (a) How are weirs classified ? How does the weir help in raising the water level or pond level ? 5

(b) What are the considerations for selecting the site for a head works ? 5

8. (a) What are the functions of canal head regulators? How are the crest levels of canal head regulators fixed ? 5

(b) What are the considerations for designing a barrage ? 5

9. (a) How can you provide safety against uplift pressure and piping problems ? 5

(b) What are the components of a spillway ? Describe ogee spillway with suitable sketch. 5

10. (a) Explain the need of an energy dissipator arrangement downstream of a spillway ? 5

(b) Explain the area-velocity method for determining stream flow. 5