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B.Tech. Civil (Water Resources Engineering)**Term-End Examination****December, 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) What do you understand by a conservation and flood control project ? What are the uses of a mass curve ? 5
- (b) What do you mean by reservoir sedimentation ? How will you find out the life of a reservoir ? 5
2. (a) Distinguish amongst storage, diversion and detention dams. 5
- (b) How will you prevent the seepage from the reservoir ? 5
3. (a) Describe the various modes of failure of a gravity dam. 5
- (b) What is the purpose of a drainage gallery ? Explain its salient features with its functioning and appropriate location. 5

4. (a) What are the design requirements of a gravity dam ? 5
 (b) Explain the economical considerations of providing the top width and free-board in a gravity dam. 5
5. (a) Discuss with suitable sketches the causes of failure in earth dam. 5
 (b) Explain the Swedish circle method for slope stability analysis of an earth dam made of c-q soil. 5
6. (a) What do you mean by "full reservoir capacity" ? Explain the policies of reservoir operations. 5
 (b) Explain the reservoir operations for the following purposes : 5
 (i) Conservation of water
 (ii) Power generation
7. (a) Describe the salient features of a weir and a barrage with their comparison. 5
 (b) What are the head works ? Describe the two types of canal head works with suitable sketches. 5
8. (a) What are scouring sluices ? What are the usual functions of scouring sluices ? 5
 (b) Discuss in brief the hydrolic design of weirs or barrages on permeable foundations. 5
9. (a) Discuss in brief the salient features of Khosla's theory for design of weir floors on permeable foundations. 5
 (b) Explain the following with suitable sketches. 5
 (i) Shaft spillway
 (ii) Sedi channel spillway.

10. (a) What are the different types of stilling basin provided below the spillway as energy dissipators ? 5
- (b) What are various measuring devices installed in gravity dam ? Discuss in brief with suitable sketches. 5
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