

FACULTY OF ENGINEERING**B.E. 4/4 (Civil) I – Semester (Main) Examination, Nov. / Dec. 2012****Subject : Water Resources Engineering and Management - II****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

1. Define Hydrologic and Hydraulic routing. (2)
2. Discuss the various factors which govern the selection of the type of dam. (2)
3. Write a note on structural failures in Embankment Dams. (2)
4. Give the detailed classification of Energy Dissipators. (2)
5. Mention four advantages of Surge Tanks. (2)
6. What do you understand by the term Reservoir sedimentation? (3)
7. What is the essential stream flow data required for the water power studies? (3)
8. Explain the terms : Relief Walls, Turfing and Berms. (3)
9. With neat sketch state the significance of side channel spillway. (3)
10. Enumerate the various forces acting on the Gravity Dams. (3)

PART – B (50 Marks)

- 11.a) How are reservoirs classified? Describe briefly various types of reservoirs. (5)
- b) Describe briefly as to how you would fix the storage capacity of a reservoir and the height of the dam required for this storage. (5)
- 12.a) What are the different ways by which a concrete gravity dam may fail, and how will you ensure its safety against each type of failure? (5)
- b) The following data were obtained from the stability of a concrete gravity dam. (5)

Total overturning moment about toe 5×10^6 kN-m
 Total resisting moment about toe 7.5×10^6 kN-m
 Total vertical force above the base 77500 kN
 Base width of the dam 65m
 Slope of the d/s face 0.75 H : 1V

Calculate the maximum and minimum vertical stress to which the foundation will be subjected to.
 What is the maximum principal stress at toe? Assume there is no tail water.

- 13.a) What is meant by pore water pressure and what is its significance in the design of earthen dams? (4)
- b) Enumerate and explain by neat sketches the different ways by which the earthen dams may fail. Also suggest suitable precautions that should be undertaken to avoid each type of failure. (6)
- 14.a) Explain in detail various components of spillway. (4)
- b) Discuss the various types of energy dissipation devices used below the spillways in relation to the position of tail water rating curve and jump height curve. (6)
- 15.a) State in detail the functions of the following in a hydroelectric installation. (6)
- i) Surge tank ii) Intake structure and iii) Anchor blocks.
- b) Write a brief note on use and types of turbines in a hydroelectric scheme. (4)
- 16.a) State the various methods of construction adopted for the earthen dams. (5)
- b) A run-off river plant is installed on a river having a minimum flow of 15.0cumec. If the plant is used as a peak load plant operating only for 5 hours a day, determine the firm capacity of the plant (5)
- i) with pondage
- ii) without pondage, but allowing 7.5% of water to be lost in evaporation and other losses. Head at plant is 17.5m and the plant efficiency may be assumed as 80%.
17. Write short notes on the following :
- a) Elementary profile and practical profile of gravity dams. (5)
- b) Flow duration curve of hydroelectric scheme. (5)
