

R13

Code No: 117JN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech IV Year I Semester Examinations, March - 2017****WATER RESOURCES ENGINEERING-II****(Civil Engineering)****Time: 3 Hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- 1.a) What is a mass inflow curve of a reservoir and how it is prepared? [2]
- b) Classify the reservoirs on the basis of their purpose. [3]
- c) What are the forces acting on a gravity dam? [2]
- d) Explain the functions of drainage gallery. [3]
- e) What is rock toe in an earth dam? [2]
- f) Enumerate priming devices for siphon spillways. [3]
- g) What is the importance of fish ladder in a diversion work? [2]
- h) Write a note on silt ejectors. [3]
- i) How energy is dissipated in Sarda type fall? [2]
- j) What is level crossing? [3]

PART-B**(50 Marks)**

- 2.a) Describe the factors that govern the selection of site for a reservoir.
 - b) Explain in detail how the life of a reservoir is determined. [5+5]
- OR**
- 3.a) Describe various types of dams.
 - b) What are the factors to be considered in the selection of a site for the dam? [5+5]
4. Design the practical profile of a gravity dam of stone masonry given the following data: RL of base of dam = 198 m; RL of HFL of reservoir = 228 m; Specific gravity of masonry = 2.4; Safe compressive stress in masonry = 1200 kN/m²; Assume weight of masonry to be 20kN/m³. Neglect earthquake pressures, wave pressure and silt pressure. Consider full uplift as per USBR recommendations. Determine the stability of the dam. [10]

OR

- 5.a) What is a gravity dam and what are the forces acting on a gravity dam?
 - b) What are the modes of failures of a gravity dam? [5+5]
- 6.a) What are the causes of failures of earthen dams?
 - b) Describe the procedure to draw the seepage line of a homogeneous earth dam with a horizontal filter at toe. [5+5]

- OR
- 7.a) Describe various types of siphon spillways.
b) Explain the design principles of ogee spillway. [5+5]

- 8.a) Describe in brief various types of weirs. Distinguish clearly between weir and barrage.
b) Briefly explain Khosla's theory and discuss the procedure to determine apron length. [5+5]

- OR
- 9.a) Explain the function of upstream and downstream piles and inverted floor at the downstream end of impervious floor.
b) A weir has a horizontal impervious floor of length of 40 m with a full reservoir depth of 5 m. The downstream water level may be assumed at floor level. Determine depths of upstream and downstream piles using Bligh's theory with a safe gradient of 1 in 15. Calculate the thickness of impervious floor just adjacent to the weir on downstream side, which is at a distance of 20 m from downstream end of the impervious floor. [5+5]

- 10.a) Draw a neat sketch of straight glacis fall and explain briefly its components.
b) Data refer to a fall site: full supply discharge 6.5 cumecs, bed width u.s./d.s = 5.6 m, full supply level u.s./d.s = 20.00/19.10 m. Full supply depth u.s./d.s = 1.20/1.20 m. Design cistern of Sarda type of fall for these conditions. Assume Bligh's seepage gradient as 1 in 7. How the energy is dissipated in this type of fall? [5+5]

OR

- 11.a) Define proportionality of an outlet. Distinguish between a hyper-proportional outlet and a sub-proportional outlet.
b) What is meant by semi-modular outlet? Explain how APM outlet is working as semi-module outlet? [5+5]

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