

B.Tech III Year II Semester (R13) Regular Examinations May/June 2016

**WATER RESOURCES ENGINEERING – II**

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- What is the necessity and location of falls?
  - Differentiate between aqueduct and super passage.
  - What do you mean by the air-line and wet-line corrections?
  - Draw neatly the meandering of river and how length of meander measured.
  - Write the importance of hydrological investigations.
  - What is the difference between diversion dam and detention dam?
  - How silt pressure can be found in case of gravity dams?
  - Define seepage line in case of earth dams.
  - Define chute spillway and where it is provided.
  - Write any two functions of surge tank.

**PART – B**  
(Answer all five units, 5 X 10 = 50 Marks)**UNIT – I**

- 2 What do you understand by a head regulator? State functions of a distributary head regulator and a cross-regulator.

**OR**

- 3 (a) How do you select a suitable type of cross-drainage work?  
(b) Write the important features of design of cross drainage works.

**UNIT – II**

- 4 What are the data to be obtained from field measurements to determine the discharge by slope –area method? Explain how the discharge is computed.

**OR**

- 5 Design a guide bank required for a bridge on a river having the following particulars:  
Design flood discharge = 50000 cumecs, Silt factor = 1.10  
Bed level of river = 130.00 m, High flood level = 140.0 m  
Also find the volume of stone required per m length of the guide bank.

**UNIT – III**

- 6 The following information is available regarding the relationship between trap efficiency and capacity-inflow ratio for a reservoir.

Capacity/inflow ratio	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Trap efficiency ( $\eta$ %)	87	93	95	95.5	96	96.5	97	97.2	97.3	97.5

Find the probable life of the reservoir with an initial reservoir capacity of 30 million cubic meters, if the annual flood inflow is 60 million cubic meters and the average annual sediment inflow is 36,00,000 kN. Assume a specific weight of sediment equal to 12 kN/m<sup>3</sup>. The useful life of the reservoir will terminate when 80% of initial capacity is filled with sediment.

**OR**

- 7 (a) Explain about earth dams and rock fill dams with the help of neat sketches and also write its advantages and disadvantages.  
(b) Explain how we will select a good site for various types of dams.

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**UNIT – IV**

- 8 A dam 6 m high and 1.5 m wide at the top has vertical water face. Find the base width of the dam if no tension is to develop. Take unit weight of masonry as  $20 \text{ kN/m}^3$  and  $c = 1$ . Investigate the stability of the above dam if the coefficient of friction is 0.6 and maximum allowable compressive stress is  $1800 \text{ kN/m}^2$ .

**OR**

- 9 Explain in detail the causes of failures of earth dams with the help of neat sketches.

**UNIT – V**

- 10 A round crested spillway passes a design discharge of  $1 \text{ m}^3/\text{sec}$  per meter length. The coefficient of discharge may be taken as  $C_d = 0.7$ . If height of the crest above the downstream stilling basin floor level is 10 m, design the: (i) Depth. (ii) Length of the stilling basin. Depth of flow in the stream on the downstream of spillway is 1m at the design discharge of  $1 \text{ m}^3/\text{sec}$ . Enquire if the bed of the stilling basin has to be depressed.

**OR**

- 11 Explain the following components of hydroelectric scheme with the help of neat sketches:
- (a) Forebay.
  - (b) Penstocks.
  - (c) Surge tank.

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