Code No: **RT41014** **R13** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February - 2019

WATER RESOURCES ENGINEERING - II

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A(22 Marks)

1. a) What is sprinkler irrigation? What are the conditions favouring sprinkler irrigation? [4]
   b) Distinguish between Kennedy's theory and Lacey's theory. [4]
   c) What are the objectives of river training? [4]
   d) What is a weir and barrage? Distinguish between them. [3]
   e) Differentiate between: (i) elementary profile and practical profile of gravity dam and (ii) low and high gravity dams [4]
   f) Draw a neat diagram of zoned embankment. Describe the functions of each component. [3]

PART–B(3x16 = 48 Marks)

2. a) What is water logging? Explain ill effects and control measures of water logging. [8]
   b) A water course has a culturable commanded area of 1500 hectares. The intensity of irrigation of crop A is 50% and for B is 40%. Crop A is a Kharif crop and crop B is a Rabi crop. Crop A has a kor period of 21 days and crop B has kor period of 14 days. Calculate the discharge of the water course if the kor depth for crop A is 15 cm and for B it is 20 cm. [8]

3. a) Design an irrigation channel to carry 45 cumecs of discharge. Take silt factor as 1.1 and side slope as ½ : 1. Also determine the longitudinal slope. [8]
   b) Design a lined canal to carry a discharge of 180 cu.m/s on a slope of 1 in 2200. The maximum permissible velocity is 1.8 m/s and rugosity coefficient is 0.012 in Manning's formula and the side slope is 1.25 H: 1 V. [8]

4. a) Design an aqueduct for the following data.
   Canal: (i) full supply discharge = 35 cumecs (ii) Full supply level = 200.00 m (iii) Canal bed level = 198.5 m (iv) Depth of water = 1.5 m, (v) Bed width = 22 m (vi) Side slope = 1.5 : 1, Drainage: (i) High flood discharge = 350 cumecs, (ii) High flood level = 196.5 m(iii) Bed level = 193.5 m (iv) General ground level = 199.0 m, Take Manning's rugosity coefficient as 0.015 and Lacey's silt factor as 1.0. Assume any other data needed suitably. [10]
   b) What are the functions of cross-regulator and head-regulator? [6]

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5. a) Explain Khosla's method of independent variables. How do you apply corrections for interference of piles and inclination of floor? [8]
   b) Discuss the causes of failures of weirs on permeable foundations and suggest suitable control measures for each type of failure. [8]

6. a) Classify various types of dams. Discuss the factors that affect the selection of type of dam. [8]
   b) Discuss the modes of failures and criteria for structural stability of gravity dams. [8]

7. a) Explain the method of stability analysis of downstream slope during steady seepage. [8]
   b) Discuss briefly various types of energy dissipaters that are used for energy dissipation below overflow spillway, under different relative positions of TWC and JHC. [8]

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