Code: CE5T3

## III B.Tech - I Semester – Regular Examinations – December 2016

## WATER RESOURCES ENGINEERING - I
### (CIVIL ENGINEERING)

Duration: 3 hours                                    Max. Marks: 70

## PART – A

Answer ***all*** the questions.   All questions carry equal marks

$$11x\ 2 = 22\ M$$

1.
   a) Write about the methods for computing average rainfall over a basin.
   b) What are the factors affecting infiltration?
   c) Define effective rainfall and unit hydrograph.
   d) Distinguish between hydraulic and hydrologic routing.
   e) Write about storage coefficient.
   f) Write about the aquifer parameters.
   g) Explain the importance of irrigation.
   h) Write about the ill effects of water logging.
   i) What are the different irrigation efficiencies?
   j) Elaborate about balancing depth.
   k) Write assumptions of Lacey's theory.

# PART – B

Answer any **THREE** questions.   All questions carry equal marks.                                                           3 x 16 = 48 M

2. a) Explain rainfall mass curve and hyetograph with the help of neat sketches. How a rainfall hyetograph can be derived from a given rainfall mass curve?                                    8 M

   b) Define $\phi$ index and W- index and bring out the difference between them. How $\phi$ index is determined from the rainfall hyetograph?                                                    8 M

3. a) Define hydrograph. Draw a single peaked hydrograph and indicate its various  components. It is ascertained that various factors affect the shape of the flood hydrograph. What are those factors? Grouping the above under rainfall factors, loss factors and physiographic factors, indicate how all these affect the shape of the hydrograph?             8 M

   b) What is regional flood frequency analysis? Explain stepwise procedure for homogeneity test and regional flood frequency analysis.                                         8 M

4. a) A 20cm diameter well penetrates fully a confined aquifer of thickness 25m. When the well is pumped at a rate of 200 liters/minute. The steady drawdown in the two observation wells located at 10m and 100m distance from the pumping well are found to be 3.05m and 0.05m respectively.

Calculate the permeability and the transmissivity of the aquifer. 8 M

b) Write about open wells and tube wells. Explain how tube wells are constructed. 8 M

5. a) Discuss various methods of irrigation and state the advantages of each method. 8 M

b) Describe frequency of irrigation. Derive the expression for it. Explain the types of irrigation efficiencies. 8 M

6. a) Explain the tractive force concept in alluvial canal design. 8 M

b) State the drawbacks of Kennedy's theory. Design a canal section using Kennedy's theory to carry a discharge of 46 cumecs. Assume N=0.0025, m=1 and B/D ratio as 8. 8 M