

Code: CE5T3

**III B.Tech - I Semester – Regular/Supplementary Examinations
October 2019**

**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) What is difference between run-on and run-off?
- b) Draw a neat sketch of Hydrological cycle.
- c) What is practical use of Unit hydrograph?
- d) What is meant by attenuation of flood?
- e) What is IUH? State its purpose.
- f) Distinguish between water table and piezometric surface.
- g) What is intrinsic permeability in Darcy's law if coefficient of permeability of soil is 0.51 cm/s and kinematic viscosity is $0.009 \text{ cm}^2/\text{s}$.
- h) What are the ill effects of irrigation?
- i) Find the delta for a crop when its duty is $864 \text{ hectares/cumec}$ on the field, the base period of this crop is 120 days.
- j) What is Critical velocity ratio? Write its equation.
- k) What is difference between regime in natural rivers and in artificial channels?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) What are the infiltration indices? Explain the procedure for their computations. 8 M

b) The isohyets drawn for a storm which occurred over a drainage basin of area 950 Km² yield the following information. 8 M

Isohyet interval in mm	85-75	75-65	65-55	55-45	45-35
Area between isohyets in Km ²	125	236	264	175	150

Determine the average depth of rainfall over the basin.

3. a) Define Hydrograph. What are the components of Hydrograph? Explain any one method of base flow separation. 8 M

b) For a date of maximum recorded flood of a river, the mean and standard deviation are 4500m³/s and 1700m³/s, respectively. Using Gumbel's extreme value distribution, estimate the return period of a design flood of 9500m³/s. Assume an infinite sample size.
($\bar{y}_n=0.57722$ and $\sigma n = 1.28255$) 8 M

4. a) Derive an equation for steady radial flow to wells in unconfined aquifers along with assumptions. 8 M
- b) A 30cm diameter well penetrates 20m below the static water table. After 24 hours of pumping at 5000 liters per minute the water level in a test well at 100m away is lowered by 0.5m, and in a well at 30m away the draw down is 1m. What is transmissibility of the aquifer? 8 M
5. a) What is meant by consumptive use? Explain the various methods of estimation of consumptive use. 8 M
- b) Discuss various methods of assessment of quality standards of irrigation water. 8 M
6. a) Enumerate various types of linings used for canal and their suitability. 8 M
- b) The slope of a channel in alluvial soil is $1/5900$. Design the channel section and the maximum discharge which can be allowed to flow in it. Take Lacey's silt factor $f=1$. The channel is of trapezoidal section, having side slopes 0.5:1 8 M