Registration No : ☐☐☐☐☐☐☐☐☐☐

Total Number of Pages : 02

B.Tech
PCI5J001

5th Semester Regular/Back Examination 2019-20
WATER RESOURCE ENGINEERING
BRANCH : CIVIL
Max Marks : 100
Time : 3 Hours
Q.CODE : HRB387
Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1   **Only Short Answer Type Questions (Answer All-10)**   **(2 x 10)**
- **a)** State the characteristics of Glaze and Drizzle.
- **b)** Write the name of the plots which are plotted (i) time vs intensity and (ii) time vs accumulated precipitation?
- **c)** List out the analytical methods to estimate evapotranspiration.
- **d)** What is the science and practice of water flow measurement called?
- **e)** Define rating curve.
- **f)** How does the peak discharge in a channel vary with area of the catchment?
- **g)** What is ERH?
- **h)** How do you distinguish open channel and closed conduit?
- **i)** State the conditions for rectangular channel to be the most efficient and economical.
- **j)** Write the concept of hydraulic jump.

Part-II

Q2   **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)**   **(6 x 8)**
- **a)** Classify the precipitation based on weather system.
- **b)** A reservoir had an average surface area of 20 km^2 during June 1982. In that month the mean rate of inflow is 10 m^3/s, outflow is 15 m^3/s, monthly rainfall is 10 cm and change in storage is 16 million m^3. Assuming the seepage losses to be 1.8 cm, estimate the evaporation in that month.
- **c)** Explain the procedure for checking a rainfall data for consistency.
- **d)** Describe the various models adopted to represent the variation of infiltration capacity with time.
- **e)** Illustrate the arrangement and function of Float-Gauge Recorder.
- **f)** Describe the slope area method of measurement of flood discharge in a stream.
- **g)** A storm with 10 cm precipitation produced a direct runoff of 5.8 cm. The duration of the rainfall was 16 hours and its time distribution is given below. Estimate the ϕ index.

Time from start(hr)	0	2	4	6	8	10	12	14	16
Cumulative rainfall (cm)	0	0.4	1.3	2.8	5.1	6.9	8.5	9.5	10.0

- **h)** The mean annual flood of a river is 600 m^3/s and the standard deviation of the annual flood series is 150 m^3/s. What is the probability of a flood of magnitude 1000 m^3/s occurring in the river within next 5 years? Use Gumbel's method and assume the sample size to be very large.
- **i)** Find the discharge through a rectangular channel 3.5 m wide having depth of water 2.0 m and bed slope 1 in 1500. Take the value of K= 2.36 in Bazin's formula.
- **j)** Determine the dimensions of the canal carrying a discharge of 20 cumecs. The canal has bed slope 1 in 2000. Manning's coefficient is 0.03.

k) Define specific energy. Draw a neat sketch of specific energy curve for a rectangular channel showing all details.

l) Derive the mathematical expression for critical depth and critical velocity.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Explain the different methods to estimate evapotranspiraton. **(16)**

Q4 Explain the procedure of deriving a synthetic unit hydrograph for a catchment by using Snyder's method. **(16)**

Q5 Write a brief note on frequency factor and its estimation in Gumbel's method. **(16)**

Q6 Derive the conditions for the most economical and efficient circular channel. **(16)**