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)**