

**M. TECH.-I (CIVIL-HYDRAULIC ENGINEERING) (CBCS –
2015 COURSE) : SUMMER - 2018
SUBJECT: HYDROLOGY**

Day: **Monday**
Date: **04/06/2018**

Time: **11.00 AM TO 02.00 PM**
Max. Marks: 60

S-2018-2969

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

SECTION-I

- Q.1 a)** The mass curve of precipitation resulted from the storm of 20th August 2002 (05) gave the following results.

Time (min)	0	10	20	30	40	50	60
Rainfall in (mm)	0	9.5	15.6	21	32	46	52

For the storm construct a hyetograph and draw the maximum intensity duration curve.

- b)** Explain with a sketch working of tipping bucket type rain gauge. (05)

OR

- a)** Explain the procedure of intensity duration frequency curve. State the applications of these curves. (05)
- b)** State and explain various systems for formation of precipitation. (05)

- Q.2 a)** The rates of rainfall for the successive 30 min period of a 3hr storm are 1.4, 3.5, 4.6, 2.7, 1.8, 0.9, cm/hr. Corresponding surface run off is estimated to be 4cm. Estimate the Φ index. (05)

- b)** Explain with sketch standard evaporation pan. (05)

OR

- a)** Explain the factors affecting infiltration capacity of an area. (05)
- b)** Define and explain infiltration indices. (05)

- Q.3 a)** Rainfall (P) and runoff (R) data for a small catchment are given below. (05)

P (mm)	20	27	15	3	12	18
R (mm)	8	11	5	1	4	6

Develop a linear regression equation and find the coefficient of correlation.

- b)** Explain time series analysis to solve hydrological problems. (05)

OR

- a)** Describe synthetic flow generation model. (05)
- b)** Explain Linear multiple regression and its applications in Hydrology. (05)

P.T.O.

SECTION-II

- Q.4** a) What is IUH? Explain Cleark's method of IUH. (05)
b) Explain Gumbel's method of flood frequency analysis. (05)

OR

- a) What is Synthetic Unit hydrograph? Explain Snyder's method. (05)
b) Define Unit Hydrograph and explain uses of Unit Hydrograph for flood estimation. (05)
- Q.5** a) Explain the basic equations used for flood routing by Hydrologic method. (05)
b) Describe the Muskingum method of routing an inflow hydrograph thorough a channel reach. (05)

OR

- a) Explain the Nash's model. (05)
b) Explain the method of reservoir routing. (05)
- Q.6** a) Explain how yield of an open well determined using recuperation test. (05)
b) Describe construction of strainer type of tube well. (05)

OR

- a) Derive the discharge equation for a well penetrating a confined aquifer. State the assumptions in the derivation. (05)
b) State and explain different types of aquifer. (05)

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