

M. Tech.-I (Civil-Hydraulic Engineering) (CBCS – 2015 Course) :
WINTER - 2018
SUBJECT: HYDROLOGY

Day: Monday
Date: 10/12/2018

W-2018-3107

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

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of electronic **CALCULATOR** is allowed.
- 4) Answers to both the sections should be written in the **SEPARATE** answer books.
- 5) Assume suitable data if, **NECESSARY**.

SECTION – I

- Q.1 a)** Comment on water availability in India and world. **(04)**
- b)** The mass curve of precipitation from a storm gave the following results. **(06)**

Time (Min)	0	30	60	90	120	150	180	210
Rainfall (cm)	0	2.1	4.4	5.0	7.9	8.5	8.5	9.7

For the storm construct a hyetograph and draw the corresponding intensity curve.

OR

- a)** Discuss the various points to be considered while selecting location of rain gauge station. **(05)**
- b)** Explain intensity duration frequency curves. **(05)**
- Q.2 a)** Explain Penman's method of estimation of evapotranspiration. **(04)**
- b)** Hourly rainfall of 2.5, 6, and 3cm occurs over a 25Ha area consisting of **(06)**
- 6 Ha $\phi = 3 \text{ cm/hr}$
12 Ha $\phi = 2 \text{ cm/hr}$
7 Ha $\phi = 1 \text{ cm/hr}$
Calculate hourly net runoff and total runoff in 3hr storm.

OR

- a)** Explain any one empirical method of estimation of evaporation. **(05)**
- b)** What is ϕ index and w index? Explain. **(05)**
- Q.3 a)** Describe linear multiple regression and its application in hydrology. **(05)**
- b)** Write a note on application of time series analysis. **(05)**

OR

- a)** What is auto co-relation analysis? Explain its applications in hydrology. **(05)**
- b)** Describe a synthetic flow generation model. **(05)**

SECTION – II

- Q.4** a) What do you mean by regional studies? Explain the situations under which these are carried out. (05)
- b) Explain the steps, with neat sketches in application of normal distribution for flood estimation. (05)

OR

State situation when empirical relations are used for flood estimation. Explain their limitations. (10)

- Q.5** a) A new masonry dam is to be constructed with spillway. How would you check spillway adequacy? (05)
- b) State basic equation used in flood routing and explain the terms. (05)

OR

Explain Pulse method of flood routing. (10)

- Q.6** a) Which parameters are considered in ground water quality assessment? (05)
- b) State factors leading to pollution. (05)

OR

- a) What is interference of well? Explain with sketches. (05)
- b) State different pumping tests and explain any one with suitable sketches. (05)

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