

Roll No.

24292

**B. Tech. 5th Sem. (Civil Engg.)
Examination – December, 2014**

HYDROLOGY

Paper : CE-311-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Q. No. 1 is *compulsory*. Each question carries equal mark (20 marks). Students have to attempt *five* questions in total at least *one* question from each Section. Assume suitable data if missing.

1. Write short notes on the following : $5 \times 4 = 20$
- (a) Mean precipitation,
 - (b) Evapo- Transpiration,
 - (c) Wire gauge,

24292-5100-(P-4)(Q-9)(14)

P. T. O.

(d) Unconfined aquifers,

(e) Hypsometric curve.

SECTION - A

2. (a) What is the application of hydrology to engineering problems ? Explain drainage basin and its characteristics. 10

(b) What is meant by Probable Maximum Precipitation (PMP) over a basin ? Explain how PMP is estimated ? 10

3. The normal annual precipitation of five raingauge station P, Q, R, S and T are respectively 135, 105, 96, 113 and 177 cm. During a particular storm the precipitation recorded by stations P, Q, R, S are 15.2, 9.2, 7.8 and 15.2 respectively. The instrument at station T was inoperative during that storm. Estimate the rainfall at station T during that storm. 20

SECTION - B

4. Distinguish between : 10 + 10 = 20

(a) Infiltration capacity and infiltration rate.

(b) Field capacity and permanent wilting point.

5. In a 140 min. storm the following rates of rainfall were observed in successive 20 min intervals : 8.0, 8.0, 18.0, 15.0, 2.0, 3.0 and 12.0 mm/h. Assuming ϕ index value as 3.0 mm/h and an initial loss of 0.9 mm, determine the total rainfall, net runoff and W index for the storm.

20

SECTION - C

6. List the factors affecting the seasonal and annual runoff (yield) of a catchment. Describe briefly the intersection of factors listed by you.

20

7. (a) What is an IUH ? What are its characteristics ?

10

- (b) Given below are observed flows from a storm of 6 h duration on a stream with a catchment area of 500 km². Assuming the base flow to be zero derive the ordinates of the 6-h unit hydrograph :

10

Time observed (h)	0	6	12	18	24	30	36	42	48
Flow (m ³ /s)	0	200	350	100	140	160	90	50	45

SECTION - D

8. Describe the recovery test to estimate the transmissivity of a confined aquifer. 20

9. Explain the following : $4 \times 5 = 20$

- (a) Specific capacity
 - (b) Well loss
 - (c) Specific yield
 - (d) Bulk pore velocity
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