

hydrograph. If the area of the catchment is 567 km².
Calculate base width of 3-h unit hydrograph by
assuming it to be triangular in shape. 15

SECTION – D

8. (a) Explain functional requirements of water resources projects. 7.5
(b) What is the need for planning of water resources projects ? Discuss briefly the various steps involved in planning of water resources projects. 7.5
9. (a) What is basin wise planning in water resource ? 7.5
(b) What is system analysis in water planning ? 7.5

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(4)

Roll No.

3201

**B. Tech. 5th Semester (Civil Engg.)
Examination – December, 2022**

HYDROLOGY AND WATER RESOURCE ENGINEERING

Paper : PCC-CE-301-G

Time : Three Hours]

[Maximum Marks : 75

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 : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.
All questions carry equal marks.

1. Write short notes on the following : 2.5 × 6 = 15
- (a) Forms of Precipitation
 - (b) Hydrograph
 - (c) Non-recording gauges

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- (d) Effect of urbanization on run-off hydrograph
- (e) Classification of run-off
- (f) Uses of Current meter

SECTION – A

2. (a) What is the hydrological cycle ? Give a brief description of different components of a hydrologic cycle. 8
- (b) Explain briefly intensity duration frequency relationship. 7
3. A watershed has five non recording rain gauges, installed in its area. The amount of rainfall recorded for one of the years is given below : 15

Station	A	B	C	D	E
Rain Fall (cm.)	100	120	190	95	125

Find the required optimum number of non-recording and recording raingauges for this watershed. Assume an error of 10% in the estimation of the mean rainfall.

SECTION – B

4. (a) Explain different methods of evaporation. 7.5
- 3201-1500-(P-4)(Q-9)(22) (2)

- (b) Explain evaporation and factors affecting the evaporation. 7.5
5. The mass curve of rainfall of duration 100 min. is given below. If the catchment had an initial loss of 0.6 cm and a ϕ -index of 0.6 cm/h, calculate the total surface runoff from the catchment. 15

Time from start of rainfall (min.)	0	20	40	60	80	100
Cumulative rainfall (cm.)	0	0.5	1.2	2.6	2.6	3.5

SECTION – C

6. (a) What is meant by Unit hydrograph and what are the various assumptions ? 7
- (b) Explain rational method and empirical formula used for estimation of floods. 8
7. The peak of flood hydrograph due to 3-h duration isolated storm in a catchment is 270m³/s. The total depth of rainfall is 5.9 cm. Assuming an average infiltration loss of 0.3 cm/h and a constant base flow of 20m³/s. Estimate the peak of 3-h unit