

6. (a) Differentiate between the following :
- (i) Hydraulic routing and hydrologic routing.
 - (ii) Channel routing and reservoir routing. (10)
- (b) What is watershed management? Explain the objectives of Watershed Management. (5)

7. Discuss the methods of the base flow separation from the storm hydrograph. (15)

Time from start	0	6	12	18	24	30	36	42	48	54	60
Ordinate of 6 hr UH	0	250	600	800	700	600	450	320	200	100	50

May 2024

**B.Tech. (Civil) VI SEMESTER
Engineering Hydrology (PCC-CED-309)**

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.
2. Answer any four questions from Part-B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.
4. Use of Non-programmable scientific calculator is allowed.

PART-A

1. (a) What do you understand by precipitation? Mention types of precipitation. (1.5)
- (b) Define infiltration index. How do you determine it? (1.5)
- (c) Define overland flow and interflow. (1.5)
- (d) Explain the rational formula for determining runoff. (1.5)

- (e) Explain the straight-line methods of separation of base flow. (1.5)
- (f) Define Hydrologic routing. (1.5)
- (g) Define Synthetic Unit hydrograph. (1.5)
- (h) Define probable maximum flood. (1.5)
- (i) Explain mass curve. (1.5)
- (j) Define hietograph. (1.5)

PART-B

- 2. (a) What are the different types of current meters and explain their working principle. (10)
- (b) Describe different forms of precipitation and types of precipitation. (5)
- 3. (a) Explain the Intensity -Duration -Frequency curves with neat necessary sketches. (5)
- (b) In a watershed, four rain gauges I, II, III, IV are installed. The depths of normal annual rainfall recorded at these stations are 80.0, 65.0, 75.5, and 92.0 cm respectively. The rain gauge at station I went out of order during one of the years. The annual precipitation for that year, recorded at the other three stations was 90.0, 72.5, and 80.0 cm at II, III, and IV stations respectively. Estimate the rainfall at station I in that year. (10)

- 4. The ordinates of 8-hour UH for a hydrograph basin are given below. Determine the ordinates of 24hr UH using the method of superposition. (15)

Time	Ordinates of 8h UH	Time	Ordinates of 8h UH	Time	Ordinates of 8h UH
0	0	32	231	64	14
4	5.5	36	165	68	9.5
8	13.5	40	112	72	6.6
12	26.5	44	79	76	4.4
16	45	48	57	80	2
20	82	52	42	84	1
24	162	56	31	88	0
28	240	60	22		

- 5. (a) Discuss the methods of the base flow separation from the storm hydrograph. (5)
- (b) The ordinates of 6 hr UH are given. A storm of 3 successive intervals of rainfall with magnitude 3cm, 5cm, and 4cm, respectively. Assume a ϕ index of 0.2cm/hr and a base flow of 30m³/sec. Determine the resulting flood hydrograph. (10)

Time from start	0	6	12	18	24	30	36	42	48	54	60	66
Ordinates of 6h UH	0	250	600	800	700	600	450	320	200	100	50	0