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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- APRIL 2022

B.Tech IV Semester

COURSE CODE: 18B11CE414

MAX. MARKS: 25

COURSE NAME: Water Resource Engineering

COURSE CREDITS: 03

MAX. TIME: 1.5 HR

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data if required and not provided.

1. Analysis of data on maximum one day rainfall depth at a station indicated that rainfall of 300 mm has a return period of 40 years. Determine the probability of rainfall equal to or greater than 300 mm occurring:
 - a. Twice in 25 successive years
 - b. At least once in 20 successive years.

[2+2]

2. Estimate the emerging volume of runoff from the given storm and catchment data:

Sub-Area (km ²)	Φ -index (cm/hr)	Hourly Rain (cm)		
		1st	2nd	3rd
14	2.0	1.5	5.0	0.8
21	3.5	1.5	5.0	0.9
28	1.0	1.7	7.0	1.5

[4]

3. The data on the current meter observation taken at 0.6 depth is given below in the tabular form. The equation of the current meter is $V(m/s)=0.65N_s+0.03$ where N_s is in revolutions per second.

Distance from one bank(m)	Depth(m)	Current meter observation at 0.6 depth	
		No. of revolutions	Time in seconds
3.0	0.4	30	150
6.0	0.8	50	130
9.0	1.2	70	100
12.0	2.0	100	80
15.0	3.0	150	60
18.0	2.5	200	50
21.0	2.2	130	40
24.0	1.0	90	130

Calculate the stream discharge.

[5]

4. Evaluate the amount of evapotranspiration from an area if the total rainfall during a storm is 10 mm. Given the antecedent moisture at the root in the soil was 5 mm, the loss of water due to seepage 2.5 mm, losses due to percolation 2 mm, surface runoff 3 mm and the moisture retained in the soil is 1 mm.

[2]

5. Derive the modified Horton's equation and explain its significance.

[4]

6. Explain the following in brief:

a. Bubble Gauge Recorder

b. Ultrasonic method

[3+3]