

**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL/MAY 2023**  
Eighth Semester  
**Civil Engineering**  
**CE8091 - HYDROLOGY AND WATER RESOURCES ENGINEERING**  
(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

	<i>Marks,</i> <i>K-Level, CO</i>
1. Enlist the various forms of precipitation.	2,K1,CO1
2. What are all the methods available to find the average depth of precipitation over an area?	2,K1,CO1
3. Define infiltration.	2,K1,CO2
4. List the methods to calculate evaporation.	2,K1,CO2
5. What is meant by Runoff?	2,K1,CO3
6. What are all the applications of unit hydrograph?	2,K1,CO3
7. What do you understand by the term Design flood?	2,K1,CO4
8. What are the uses of flood flow frequency analysis?	2,K1,CO4
9. What is meant by a Reservoir?	2,K1,CO5
10. Define dead Storage.	2,K1,CO5

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Enlist the different recording type of rain gauges and explain any one of type rain gauge with suitable sketch in brief. 13,K2,CO1
- OR**
- b) Explain the different types of precipitation. 13,K2,CO1
12. a) Explain the following terms in brief: 13,K2,CO2
- (i) Infiltration capacity
- (ii) Infiltration rate
- (iii) Infiltration indices ( $w$ -index and  $\phi$ -index)
- OR**
- b) Point rainfalls due to a storm at several rain gauge stations and around basin and the area of polygon associated with each of the rain gauge stations is given in the table below. Determine the mean depth of rainfall over the basin by Thiessen polygon method. 13,K2,CO2

Rain Gauge Station	Rainfall due to storm (cm)	Area of the polygon (km <sup>2</sup> )
A	8.8	570
B	7.6	920
C	10.8	720
D	9.2	620
E	13.8	520
F	10.4	550
G	8.5	400
H	10.5	650
I	11.2	500
J	9.5	350
K	7.8	520
L	5.2	250
M	5.6	350
N	6.8	100
O	7.4	160

13. a) The ordinates of 3 hour unit hydrograph are given below: 13,K3,CO3

Time	0	3	6	9	12	15	18	21	24	27	30
Ordinates	0	10	25	20	16	12	9	7	5	3	0

Find the ordinates of 6 hour unit hydrograph analytically for same. Also sketch this Unit hydrograph. What is the peak value of discharge in this Unit hydrograph?

**OR**

- b) Describe about the factors affecting runoff in detail. 13,K3,CO3
14. a) Explain in detail the structural and non- structural methods of flood control method. 13,K2,CO4

**OR**

- b) Discuss various types of drought. Explain the causes of drought. 13,K2,CO4
15. a) Explain in detail about classification of reservoirs. 13,K2,CO5

**OR**

- b) Explain the mass curve method that can be used for determining the Reservoir capacity for fulfilling given demand. 13,K2,CO5

**PART - C (1 × 15 = 15 Marks)**

16. a) Explain with neat sketches various types of aquifers. 15,K2,CO6

**OR**

- b) Explain in detail the rain water harvesting practice in urban and rural areas. 15,K2,CO6

