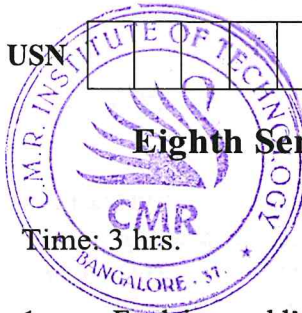


USN

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**Eighth Semester B.E. Degree Examination, July/August 2021**  
**Water Resources Engineering**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions.**

- 1 a. Explain world's fresh water resources distribution and importance of water management in today's world. (04 Marks)
- b. Explain any three water management sectors. (06 Marks)
- c. Discuss the various agencies included in water management community. (10 Marks)
- 2 a. Explain the process of precipitation and also discuss its forms. (10 Marks)
- b. Compute the mean annual precipitation for the river basin data given in the table below by :  
 i) Arithmetic Mean Method ii) Thiessen Polygon method.

Station	A	B	C	D	E	F	G	H	I
Rainfall (cm)	84	81	69	79	63	58	61	69	56
Area enclosed (km <sup>2</sup> )	7.88	2.80	8.67	12.57	3.02	5.79	5.22	8.45	8.05

- c. Write a short note on design storm. (04 Marks)
- 3 a. Define drainage basin and explain any four characteristic of drainage basin that affects runoff. (10 Marks)
- b. Develop the triangular SCS unit hydrograph for a watershed of area 7.0km<sup>2</sup> and average slope is 3 percent. The hydraulic length is 2000m and CN = 85. (10 Marks)
- 4 a. Explain any three surface irrigation methods. (06 Marks)
- b. Discuss any two draught management options. (04 Marks)
- c. The average monthly adjusted run off of a river during a critical year are as follows :

Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Runoff (ha-m)	500	350	650	600	300	650	7500	6000	3500	2500	600	700

If there is a uniform demand of 6 cumecs, determine the reservoir capacity. (10 Marks)

- 5 a. Define flood plain with a neat sketch. (04 Marks)
- b. What are the tangible and intangible benefits from a flood control? (06 Marks)
- c. Explain any four structural and one non-structural measures adopted for flood control. (10 Marks)
- 6 a. The following data is available regarding various types of area R the corresponding impermeability factors of a town.

S.N	Type	Percent area	Impermeability Coefficient
1	Roofs	15%	0.90
2	Pavements	20%	0.80
3	Lawn	40%	0.15
4	Unpaved	15%	0.20
5	Wooded	10%	0.05

Determine the average coefficient of runoff. If the total area of the district is 20 hectares determine the maximum storm water flow for a rainfall intensity of 50 mm/hr having of frequency of once in five years. Use rational formula. (05 Marks)

- b. Discuss the effect of urbanization on storm water runoff. (05 Marks)
- c. Explain the various subsurface practices for stormwater control. (10 Marks)

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- 7 a. Explain the design considerations for highway pavement drainage. (10 Marks)  
b. Why drainage inlets are provided in street Gutters? Explain any three types of drainage inlet with neat sketch. (10 Marks)
- 8 a. Explain the classification of dams based on hydraulic design with sketch. (10 Marks)  
b. What are the essential requirements of a spillway? Describe the various components of a spillway along with their functions. (10 Marks)

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