

C020512(020)

B. Tech. (Fifth Semester) Examination, Nov.-Dec. 2021

AICTE
(New Scheme)

(Civil Engg. Branch)

**HYDROLOGY and WATER RESOURCES
ENGINEERING**

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

***Note : Attempt all questions. From all the units
question (a) is compulsory and from
remaining parts attempt any two questions.***

Unit-I

1. (a) Define the term hydrologic cycle. 4
- (b) What do you understand by water budget
equation? 8

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- (c) Describe the principle of working of a float-type recording rain gauge with a neat sketch. 8
- (d) Describe the different methods of determining the mean precipitation over a given area. 8

Unit-II

2. (a) What is evaporation process? 4
- (b) Explain the factors affecting infiltration capacity. 8
- (c) A 7 hour storm produced the following rainfall intensities (in mm/hr) at half an hour intervals over a basin of area 1830 km², 4, 9, 20, 18, 13, 11, 12, 2, 8, 16, 17, 13, 6 and 1. If the corresponding observed runoff is m³. Determine the phi-index for a basin. 8
- (d) Explain various methods of base flow separation from hydrograph. 8

Unit-III

3. (a) Define consumptive use. 4
- (b) Derive a relationship between duty and delta, and explain the methods of improving duty of irrigation water. 8

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- (c) Write about drip irrigation in detail with neat sketch. 8
- (d) The following data pertains to the healthy growth of a crop. 8
- (i) Field capacity of soil = 30%
 - (ii) Permanent wilting percentage = 11%
 - (iii) Density of soil = 1300 kg/m³
 - (iv) Effective depth of root zone = 700 mm
 - (v) Daily consumptive use of water for the given crop = 12 mm
- For healthy growth moisture content must not fall below 25% of the water holding capacity between the field capacity and the permanent wilting point. Determine the watering. 8

Unit-IV

4. (a) Distinguish between a contour canal and ridge canal. 4
- (b) Design an irrigation channel in alluvial soil for the following data : 8
- Full supply discharge (Q) = 15 cumecs, Lacey's silt factor = 1, silt slope of channel.

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- (c) Describe various methods adopted as anti-water logging measures. 8
- (d) Explain the different types of canal lining. 8

Unit-V

5. (a) What is reservoir sedimentation? 4
- (b) Describe the types of reservoir based on the purpose served. 8
- (c) Explain the following : 8
- (i) Safe yield and Design yield
 - (ii) Storage zone of reservoir
- (d) Describe the graphical method of flood routing. 8