

CBCS SCHEME

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15CV73

Seventh Semester B.E. Degree Examination, July/August 2021 Hydrology and Irrigation Engineering

Time: 3 hrs.

Max. Marks: 80

Note: 1. Answer any FIVE full questions.
2. Missing data if any may be assumed suitably.

- 1 a. Explain Horton's representation of Hydrological cycle. (08 Marks)
b. Give the importance of Hydrology as applied to various fields. (08 Marks)
- 2 a. Explain the different types of precipitation with sketches. (08 Marks)
b. A catchment has seven rain gauge stations. In a year the annual rainfall recorded by the gauges are as follows:

Station	A	B	C	D	E	F	G
Rainfall (cm)	130	142.1	118.2	108.5	165.2	102.1	146.9

For a 5% error in the Estimation of the mean rainfall, calculate the minimum number of additional rain gauges to be installed in the catchment. (08 Marks)

- 3 a. Explain the various methods of Estimation of Lake Evaporation. (08 Marks)
b. Mention the various factors affecting Evapo transpiration. (08 Marks)
- 4 a. Define the term Infiltration capacity of soil. Explain Horton's Infiltration capacity curve, with a neat sketches. (08 Marks)
b. A reservoir has an average surface area of 20km² during June 2012. In that the mean rate of flow was 10m³/sec, mean outflow was 15m³/sec. Monthly rainfall was 10cm and change in storage was 16 million cubic meter. Assuming the seepage losses to be 1.8cm, estimate the Evaporation in that month. (08 Marks)
- 5 a. Explain the factors affecting Runoff. (08 Marks)
b. What are the components of hydrograph? Explain how base flow is separated from a simple storage hydrograph. (08 Marks)
- 6 a. Mention the Applications and Limitations of Unit Hydrograph theory. (08 Marks)
b. Following ordinates of Flood Hydrograph (FGH) were recorded in a stream resulting from a storm is a catchment having an area of 15,400 hectares. Base flow is 5 cumecs.

Time in hours	0	12	24	36	48	60	72	84	96
Discharge in cumecs	5	10	20	35	30	20	15	10	5

- i) Find the Runoff in cm.
ii) Find the ordinates of the unit hydrograph. (08 Marks)
- 7 a. What are the benefits and ill effects of Irrigation? (08 Marks)
b. Explain the factors affecting duty of Irrigation water. (08 Marks)

- 8 a. Explain the necessity of Irrigation for tropical country like India. (08 Marks)
b. Determine the discharge at the head works from the following data :
GCA = 500 Hectares , CCA = 80% of GCA , 50% of CCA is under wheat cultivation.
30% of CCA is under pulse cultivation , 10% of CCA is under paddy cultivation.
The duty of water is 1800 Hect/cumec for wheat
1000 Hect/cumec for paddy
2000 Hect/cumec for pulses.
Conveyance losses constitute 40% of release at head – works. (08 Marks)
- 9 a. Give the classification of canals. Explain salient features of each of them. (08 Marks)
b. Give the comparison between Lacey's theory and Kennedy's theory. (08 Marks)
- 10 a. Explain with a neat sketch, the various zones of a reservoir. (08 Marks)
b. Design an irrigation canal section to carry 50 cumecs of water at a slope of 0.25 meter per km. Given that $N = 0.0225$ and $m = 1.0$. With usual notations. (08 Marks)
