

ONE TIME EXIT SCHEME

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10CV55

Fifth Semester B.E. Degree Examination, April 2018
Hydrology and Irrigation Engineering

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.
2. Missing data, if any, may be suitably assumed.

PART - A

- 1 a. What do you understand by precipitation? With the help of neat sketches explain the different types of precipitation. (08 Marks)
- b. Describe with a neat sketch the principle of working of syphon type recording rain gauge. (06 Marks)
- c. The analysis of a storm yielded the following information regarding isohyets. Calculate the average depth of rainfall.

Isohyets interval in mm	70-80	80-90	90-100	100-110	110-120	120-130
Area in km ²	10	85	113	98	136	67

(06 Marks)

- 2 a. Explain the factors affecting evaporation. (05 Marks)
- b. With a neat sketch, explain how infiltration rate is measured using double ring infiltrometer. (07 Marks)
- c. A 6 hour storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm/h in successive one hour intervals over a basin of 800sq. km. The resulting runoff is observed to be 2640 hectare meters. Determine ϕ -index for the basin plot the given rainfall hyetograph. (08 Marks)

- 3 a. What is unit hydrograph? List the assumptions involved in the unit hydrograph theory. (04 Marks)
- b. Describe any two methods of separating the base flow from the total runoff. (06 Marks)
- c. In a typical 3 hours storms producing 60mm runoff from a basin, it flows in the stream as follows:

Time (hrs)	0	3	6	9	12	15	18	21	24	27	30
Flow (m ³ /s)	0	1220	4060	6750	5670	4500	3375	2300	1350	500	0

Estimate as accurately as possible the peak flow and the time of its occurrence in a flood created by a 6 hours storm which produces 30mm of runoff during the 1st 3 hours and 45mm runoff during the 2nd 3 hours plot 6 hour FHG. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

- 4 a. Define flood. Explain the envelope curves method of estimation flood. (06 Marks)
b. An engineer is required to design a drainage system for an airport with an area of 2.5 km² for a 50 year return period. the 50 year rainfall intensity in that region is given by:

$$I = \frac{35}{(t+10)^{0.38}}$$

Where I is the intensity in cm/h and 't' is the duration in minutes. If the concentration time for the area is estimated as 50 minutes, for what discharge must he design the system? (06 Marks)

- c. Explain : i) Flood routing ii) Hydrological routing. (08 Marks)

PART - B

- 5 a. Define irrigation. Explain environmental impacts of irrigation. (06 Marks)
b. List the advantages and disadvantages of irrigation. (04 Marks)
c. Classify different types of irrigation systems. Explain one of them in brief. (10 Marks)
- 6 a. Discuss briefly the various soil groups of India. (08 Marks)
b. Describe with the help of sketch various forms of soil moisture. (08 Marks)
c. Write a note on frequency of irrigation. (04 Marks)
- 7 a. Explain the terms : i) duty ii) delta iii) base period. (06 Marks)
b. Explain the various types of irrigation efficiencies. (10 Marks)
c. A crop requires 900mm of water for a base period of 120-days. Find the duty of water. (04 Marks)
- 8 a. Describe briefly the various considerations made in the alignment of an irrigation canal. (08 Marks)
b. Design an irrigation canal to carry a discharge of 5 cumec. Assume N = 0.0225; m = 1.0 and [B/D] = 3.24. (Use Kennedy's method). (12 Marks)