CBCS SCHEME

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18CV63

Sixth Semester B.E. Degree Examination, June/July 2024
Hydrology and Irrigation Engineering

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

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.

Module-1

1 a. Explain with neat sketch, qualitative representation of hydrological cycle. **(10 Marks)**

b. List and explain different types of precipitation. **(10 Marks)**

OR

2 a. Explain with neat sketch, syphon type of raingauge. **(10 Marks)**

b. Average annual rainfall of four existing raingauge stations in a basin are 105mm, 79mm, 70mm and 66mm. If the average depth of rainfall over the basin is limited with in 10% error. Determine the additional number of gauges required. **(10 Marks)**

Module-2

3 a. Explain how evaporation amount is measured using IS class-A pan. List the factors affecting it. **(10 Marks)**

b. The total observed runoff volume during a 6hr-storm with a uniform intensity of 1.5cm/hr is $21.6 \times 10^6 m^3$. If the area of the basin is $350km^2$, find the average infiltration rate for the basin. **(10 Marks)**

OR

4 a. List the factors affecting evapo-transpiration. Write Blaney-criddle equation used to estimate evapo-trnaspiration. **(10 Marks)**

b. With a neat sketch, describe the method of determining infiltration capacity using a double ring infiltrometer. **(10 Marks)**

Module-3

5 a. What is run off? Explain the factors affecting run off. **(10 Marks)**

b. The ordinates of a storm hydrograph due to 6h isolated storm is given. Obtain the ordinates of 6h unit hydrograph for the catchment, if its area is $423km^2$.

Time (hr)	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Discharge (m^3/s)	10	32	88	116	102	85	71	59	47	39	32	26	22	18	15	10

(10 Marks)

OR

6 a. Explain with a neat sketch, base flow separation methods. **(10 Marks)**

b. Define unit hydrograph. Mention the assumptions and its limitations of unit hydrograph. **(10 Marks)**

Module-4

7 a. Briefly explain the benefits and ill effects of irrigation. **(10 Marks)**

b. With a neat sketch, explain Bandhara irrigation. List its advantages and disadvantages. **(10 Marks)**

OR

8 a. Explain the factors affecting duty of water. (10 Marks)

b. Table gives the necessary data about the crop, their duty and area under each crop, commanded by a canal taking off from a storage tank. Taking time factor for the canal 13/20, calculate the discharge required at the head to the canal. If the capacity factor is 0.8, determine the design discharge.

Crop	Base period (days)	Area (ha)	Duty (ha/cumec)
Sugar cane	320	850	580
Overlap for sugar cane in summer	90	120	580
Wheat (Rabi)	120	600	1600
Bajri (Monsion)	120	500	2000
Veg (Hot weather)	120	360	800

(10 Marks)

Module-5

9 a. What is canal? List its types and explain the classifications based on capacity. (10 Marks)

b. Design the canal for the discharge of 30 cumec with silt factor 1.0. Side slope – 0.5H:1V. (10 Marks)

OR

10 a. Explain the investigations of reservoir planning. List the points to be considered for selection of site for a reservoir. (10 Marks)

b. Explain different storage zones of reservoir with neat sketch. (10 Marks)

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