CBCS SCHEME

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17CV73

Seventh Semester B.E. Degree Examination, Jan./Feb.2021
Hydrology and Irrigation Engineering

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. List and explain the importance of hydrology. **(10 Marks)**

b. What is hydrological cycle? Explain with neat sketch, Horton's engineering representation of hydrological cycle. **(10 Marks)**

OR

2 a. What is Rain gauge? Explain with neat sketch non recording types of raingauge. **(10 Marks)**

b. The average annual rainfall of 6 rain gauge stations in a basin are 89, 68, 54, 45, 41 and 55 cm. If the error in the estimation of basin rainfall should not exceed 10%. How many additional rain gauges should be installed in the basin? **(10 Marks)**

Module-2

3 a. What is evaporation? Explain the factors affecting evaporation. **(10 Marks)**

b. A reservoir had a average surface area of 20 km^2 during June. In that month the mean rate of inflow = 10 m^3/sec. Mean outflow = 15 m^3/sec, monthly rainfall = 10 cm and change in storage = 16 million m^3. Assuming the seepage losses to be 1.8 cm. Estimate the evaporation in that month. **(10 Marks)**

OR

4 a. Explain the process of methods to control evaporation from lakes. **(10 Marks)**

b. What are the factors affecting the infiltration? Explain with neat sketch double ring infiltrometer. **(10 Marks)**

Module-3

5 a. What is runoff? List and explain the factors affecting on it. **(10 Marks)**

b. The following ordinates are of 3 hr unit hydrograph. Find out the volume of surface runoff from 1.5 cm effective rainfall of 3 hr duration.

Time in (Hr)	0	6	12	18	24	30	36	42	48	54	60
Unit Hydrograph ordinates	0	5.1	21.6	27	23.5	17	10.7	6.2	3.2	1	0

(10 Marks)

OR

6 a. Define Hydrograph. With neat sketch explain component parts of hydrograph. **(10 Marks)**

b. Find out the ordinates of a storm hydrograph resulting from a 3 hr storm with rain fall of 3, 4.5 and 1.5 cm during subsequent 3 hr intervals. The ordinates of unit hydrograph are given in the table.

Hr	0	03	06	09	12	15	18	21	24	03	06	09	12
OVH (cumecs)	0	90	200	350	450	350	260	190	130	80	45	20	0

Assume an initial loss of 5 mm infiltration index of 5 mm/hr and base flow of 20 cumecs. **(10 Marks)**

Module-4

7 a. What is the necessity of irrigation in India and write benefits and ill effects of irrigation? **(10 Marks)**

b. Explain in detail system of irrigation. **(10 Marks)**

OR

8 a. What is irrigation frequency? Explain the factors affecting on frequency of irrigation. **(10 Marks)**

b. The gross commanded area for a distributor is 20000 hectares. 75% of which can be irrigated. The intensity of irrigation for Rabi season is 40% that for Kharif season 10%. If Kov period is 4 weeks for Rabi and 2.5 weeks for Kharif. Determine the out let discharge. Outlet factors for Rabhi and Kharif may be assumed as 1800 hectares/cumecs and 775 hectares/cumec. Also calculate delta for each crop. **(10 Marks)**

Module-5

9 a. Write the difference between Lacey's theory and Kennedy's theory. **(10 Marks)**

b. The slope of a channel in alluvial soil is $s = \frac{1}{5000}$. Lacey's silt factor $f = 0.9$. Channel side slope are $\frac{1}{2}H:1V$. Find the channel section and maximum discharge which can be allowed to flow in it. **(10 Marks)**

OR

10 a. With a neat sketch, explain zones of storage in a reservoir. **(10 Marks)**

b. Explain Hydrologic investigation of reservoir planning? List the points to be consider for selection of site for a reservoir. **(10 Marks)**

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