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15CV73

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

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain Global and India water availability. (07 Marks)
- b. Explain with neat sketch an engineering representation of hydrologic cycle. (09 Marks)

OR

- 2 a. What is precipitation? Explain different forms of precipitation. (09 Marks)
- b. The average rainfall of 5 rain gauges in the base stations are 890, 540, 450, 410 and 550 mm. If the error in the estimation of rain fall should not exceed 10%, how many additional gauges may be required? (07 Marks)

### Module-2

- 3 a. List the factors affecting evaporation. (05 Marks)
- b. Describe the ISI standard evaporation pan with a neat sketch. (07 Marks)
- c. What is the evaporation, if 4.75 litres of water is removed from an evaporation pan of diameter 1.22 m and the simultaneous rainfall measurement is 8.8 mm? (04 Marks)

OR

- 4 a. Describe how infiltration capacity rate can be measured using a double ring infiltrometer. (08 Marks)
- b. Define  $\phi$ -index and W-index. (04 Marks)
- c. In the month of November for a particular place, monthly percentage of hours of bright sunshine is 7.2 and mean temperatures is 18°C. If the consumptive use coefficient of crop is 0.7 for that month, find the consumptive use or evapotranspiration of the crop in mm/day by Balney-Criddle method. (04 Marks)

### Module-3

- 5 a. What is runoff? Discuss the factors affecting the runoff. (10 Marks)
- b. Explain with sketches different shapes of catchment. (06 Marks)

OR

- 6 a. What are the components of hydrographs? Explain how base flow is separated from a hydrograph. (06 Marks)
- b. What is unit hydrograph? What are the assumptions made in derivation of UH theory. (04 Marks)
- c. What are the uses and applications of unit hydrograph? (06 Marks)

### Module-4

- 7 a. What is irrigation? What are the advantages and disadvantages of irrigation? (08 Marks)
- b. Explain Bandhara Irrigation with a sketch. Give briefly the advantages and disadvantages of bandhara Irrigation. (08 Marks)

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.



OR

- 8 a. Explain the terms duty, delta and base period. Derive a relation ship between the two for a given base period. (08 Marks)
- b. If the depth of water stored at 5 points in a field are 1.0, 0.9, 0.8, 0.7 and 0.6 m. Determine the water distribution efficiency. (04 Marks)
- c. (i) Find the delta of crop if the duty is 1800 ha/cumec and the base period is 130 days.  
(ii) What would be the duty if the delta is increased by 20% and the base period reduced by 10 days? (04 Marks)

**Module-5**

- 9 a. What is Canal? What are the different types of canals? (06 Marks)
- b. Explain with a sketch Ridge canal or water shed alignment of canals. (06 Marks)
- c. Define the following terms:  
(i) Gross command area.  
(ii) Cultural command area.  
(iii) Any two difference between lined and unlined canals. (04 Marks)

OR

- 10 a. The slope of the channel in aluminum is  $\frac{1}{4000}$ , Lacey's silt factor is 0.9 and side slope are  $\frac{1}{2}(H):1(V)$ . Find the channel section and maximum discharge which can be allowed to flow in it. (08 Marks)
- b. Briefly explain :  
(i) Investigation for reservoir site.  
(ii) Economic height of a dam. (08 Marks)

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