Section D

7. Derive an expression for drawdown due to steady abstraction from a fully penetrating borewell located in confined aquifer and leading to an unsteady state of drawdown in and around the well. **10**

8. There are four wells, viz. A, B, C, D of 20 cm diameter each on four sides of square having sides of 20 cm. Pumping has been started at a rate of 2500 lpm from another wel of 20 cm which is located at the center of square. Storage coefficient of the aquifer is 0.005. Determine the drawdowns of the four wells, A, B, C and D. Transmissibility of the aquifer is 1800 lpm/m. **10**

(Compulsory Question)

9. Answer the following questions in brief : **10×2=20**

   (a) What is role of hydrological engineer ?

   (b) Enumerate the methods for measuring evaporation.

   (c) Explain infiltration indices and their importance.

   (d) What are assumptions are be made in Muskingum method for routing.

July-22-00349

B.Tech EXAMINATION, 2022

Semester VI (CBCS)

HYDROLOGY AND WATER RESOURCES ENGINEERING

CE-604

Time : 3 Hours   *Maximum Marks : 60*

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. Select a major hydrologic event such as a flood that occurred in your area and describe its effects. **10**

2. Explain the following : **10**

(a) Two methods for estimating the missing rainfall data at a station in a basin.

(b) Two methods for testing the consistency of rainfall records at a station and necessary adjustment.

Section B

3. (a) Assuming a growing season of 4 months December-March for wheat, determine the consumptive use of wheat in the month of January if the pan evaporation for the month is 9.5 cm take the consumptive use coefficient at 40% stage growth of the crop as 0.52.

(b) The rates of rainfall for the successive 30 min period of a 3-hour storm are :

1.6, 3.6, 5.0, 2.8, 2.2, 1.0 cm/hr. The corresponding surface runoff is estimated to be 3.6 cm. Establish the ϕ-index. Also determine the W-index. **10**

4. The ordinates of a 3-h UH are provided in the table below. Determine the DRH due to (a) an ER of 2 cm, and (b) two ER pulses of 2 cm and 3 cm occurring in two successive 3-hour durations each. **10**

Time (h)	3-h UH (cumecs)
0	0
3	10
6	30
9	80
12	60
15	50
18	40
21	30
24	10
27	2
30	0

Section C

5. What is meant by 'Reservoir' ? Explain, how the storage capacity of a reservoir is fixed ? **10**

6. Discuss the principal measures that should be undertaken to control the inflow sediment to an impounding reservoir. **10**

(e) Differentiate between confined and unconfined aquifers.

(f) Explain hydraulic conductivity in ground water flow.

(g) How would be assessed the depth of borewell for rainwater harvesting ?

(h) Describe the reservoir losses in brief.

(i) How to calculate economic height of a dam ?

(j) What do you mean by density currents in reservoir planning ?