

- N.B. (1) Attempt any four questions out of six questions
(2) Assume any additional data if necessary and state it clearly
(3) Explain answers with neat sketches wherever necessary

1. (a) Explain with neat sketch "Hydrological cycle" State the different process involved it **10**
(b) Differentiate between i) Hydrograph and hyetograph and ii) Convective precipitation and Orographic precipitation. **10**
2. (a) Critically compare recording rain gauge (self) with non recording type rain gauge. **10**
Explain with neat diagram any one non-recording type rain gauge
(b) During a month, a rain gauge went out of order while the other four gauges in the basin reported rainfalls of 110, 90, 120 and 115mm. If the normal annual rainfall for these four gauges are 115, 95, 125 and 120mm respectively and the normal rainfall for the broken gauge is 98cm, estimate the monthly rainfall at the broken gauge. **10**
3. (a) Define infiltration. With a neat sketch, explain the working of double ring infiltrometer **10**
(b) Explain various methods for stream flow measurement with neat sketches **10**
4. (a) Explain any three methods of determining average rainfall over a catchment. State their advantages and limitations **10**
(b) Given below are the ordinate of a 6-h unit hydrograph for a catchment. Calculate the ordinate of the DRH due to a rainfall excess of 3.5 cm occurring in 6hr **10**

Time (h)	0	3	6	12	15	18	21	24	30	36	42	48	54	60	69
UH ordinate in (m ³ /s)	0	25	50	85	125	160	185	160	110	60	36	25	16	8	0

5. (a) Briefly explain how the unit hydrograph can be used to determine the direct runoff hydrograph for any rainfall amount with any time distribution. State two main assumptions important to your explanation **10**
(b) Explain in detail various methods of estimating design flood? **10**
6. (a) Describe 1) Flood frequency analysis ii) Modified Puls method iii) Muskingum method iv) Mass curve analysis. **20**
-