

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3160610****Date:01/06/2022****Subject Name:Water Resources Engineering and Hydrology****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|-----|--|-----------|
| Q.1 | (a) | Enlist the methods that are adopted to evaluate the rate of evaporation. | 03 |
| | (b) | Describe double mass curve technique to check consistency of rain gauge station data. | 04 |
| | (c) | There are four rain-gauge stations installed on certain river basin whose normal annual precipitations amounting to 850, 520, 430 and 370mm respectively. Determine the optimum number of rain-gauges in the catchment, if it is desired to limit the error in the mean value of rainfall in the catchment to 15%. | 07 |
| Q.2 | (a) | Explain the difference between Hyetograph and Hydrograph with sketch. | 03 |
| | (b) | Describe base flow separation methods with sketch. | 04 |
| | (c) | What do you mean by flow duration curve? And also mention its uses. | 07 |
| OR | | | |
| | (c) | Define “Unit Hydrograph”. Write down the assumption made in unit hydrograph theory. | 07 |
| Q.3 | (a) | Define:- Confined aquifer, specific yield and coefficient of transmissibility | 03 |
| | (b) | Describe constant level pumping test to find the yield of an open well. | 04 |
| | (c) | Explain groundwater occurrence with sketch and define various water bearing formation. | 07 |
| OR | | | |
| Q.3 | (a) | How will you carry out hydrological investigation for planning of reservoir? | 03 |
| | (b) | Elaborate trap efficiency. Explain different methods of control of reservoir sedimentation. | 04 |
| | (c) | What are various factors that affect the site selection of dam? Discuss them briefly. | 07 |
| Q.4 | (a) | List out components of hydropower project also draw general layout of a hydropower plant. | 03 |
| | (b) | Write short note on Surge Tank | 04 |
| | (c) | Explain in brief classification of hydropower plants based on storage characteristics and based on head. | 07 |

OR

- Q.4** (a) Explain levees with sketch **03**
(b) Explain rational method of flood estimation. **04**
(c) What return period you would adopt in the design of a culvert on a drain if you are allowed to accept only 20% risk of flooding in the 50 years of expected life of the culvert? **07**

- Q.5** (a) Discuss various types of drought. **03**
(b) Describe in detail with sketch the components of the roof top rainwater harvesting system. **04**
(c) Explain “runoff enhancement”. **07**

OR

- Q.5** (a) What are the objectives of water resources planning? **03**
(b) What are functional requirement of water resources planning? **04**
(c) Describe various environmental consequences of water-resource projects. **07**
