

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3160610****Date:08-06-2026****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.

Q.1**Marks**

- (a) Explain difference between a and Hydrograph and Hyetograph **03**
- (b) Enlist different type of rain gauges and explain weighing bucket type rain gauge with sketch. **04**
- (c) The rainfall values at gauging stations and corresponding areas of Thiessen's polygons for a drainage basin are as follows calculate the average rainfall over a basin **07**

Station	A	B	C	D	E	F	G
Area of thiesen's polygon in sq km	150	120	90	100	70	80	40
Rainfall cm	9.0	12.5	8.5	12.10	10.70	13.30	9.90

Q.2

- (a) Explain cause and types of draught **03**
- (b) Explain S- curve and give its application **04**
- (c) The rate of rainfall for successive 30 minutes periods of a 4 hour storm are given below 3.4, 6.6, 8.3, 7.7, 6.5, 3.9, 4.1 and 6.2 cm/hr. . Taking a value of Φ index 4.6 cm/hr compute (i) Total rainfall (ii) Total rainfall excess (iii) W index **07**

OR

- (c) The ordinates of flood hydrograph from a 4 hour rainfall are given below, derive the ordinates of 4 hour unit hydrograph for a catchment area of 450 km² **07**

Time hours	0	4	8	12	16	20	24	28	32
Discharge cumec	25	60	95	180	340	250	100	55	25

Q.3

- (a) Give classification of hydropower plant **03**
- (b) Explain Darcey's law with assumptions made in it. **04**
- (c) Explain Reservoir sedimentation **07**

OR**Q.3**

- (a) Explain (i) Aquifer (ii) Aquiclude (iii) Storage coefficient **03**
- (b) Describe confined and unconfined aquifer. **04**
- (c) Describe determination of reservoir capacity for a specified yield using mass inflow curve **07**

Q.4

- (a) Explain different types of precipitation. **03**
- (b) Explain (i) Form factor (ii) Compactness coefficient **04**
- (c) Explain principles and objectives of water resources planning. **07**

OR**Q.4**

- (a) Explain levees and flood walls. **03**
- (b) Explain empirical and rational method of flood estimation **04**
- (c) Explain factors affecting runoff **07**

- Q.5** (a) Give Horton's equation . and explain how various exponents of the equation found by experiment. **03**
- (b) Explain zones of storage of reservoir . **04**
- (c) Explain different methods of rain water harvesting . **07**

OR

- Q.5** (a) Enlist principal component of hydroelectrical scheme . Explain any one component **03**
- (b) Enlist different methods of measurement of evaporation and explain pan evaporation method. **04**
- (c) Explain Muskingham routing method. **07**