Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

Subject Code:2150602 Date:11/12/2018

Subject Name:Hydrology & Water Resources Engineering

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.**

Q.1 **(a)** Define: Evapo- transpiration, Precipitation, Infiltration **03**

(b) What is a spillway? Explain functions of spillway. **04**

(c) Discuss the various methods of determining the average depth of rainfall over a catchment. **07**

Q.2 **(a)** Explain the various forms of precipitation. **03**

(b) Describe the various factors affecting run-off from a basin area. **04**

(c) A rain gauge recorded the following accumulated rainfall during the storm. Draw the mass rainfall curve and the hyetograph. **07**

Time (AM)	10.00	10.15	10.30	10.45	11.00	11.15	11.30	11.45	12.00
Accu. Rainfall (mm)	0.0	8.5	16.0	27	37	48	62	80	90

OR

(c) A storm with a 15.0 cm precipitation produced a direct runoff of 8.7 cm. The time distribution of the storm is as follow. Estimate the w-index and Ɵ-index. **07**

Time from start(hr)	1	2	3	4	5	6	7	8
Incremental rainfall (cm)	0.6	1.35	2.25	3.45	2.7	2.4	1.5	0.75

Q.3 **(a)** Give the difference between Specific Yield and Specific Retention for ground water. **03**

(b) Describe how to obtain the unit hydrograph from a flood hydrograph resulting from a storm of certain duration. **04**

(c) .Design a tube well for the following data: **07**
Yield required=0.081 cumec; Thickness of confined aquifer=30m; Radius of circle of influence=300m; Permeability coefficient=50m/day; Drawdown=5.1m.

OR

Q.3 **(a)** Enlist the different types of aquifers. Explain any one aquifer with neat sketch. **03**

(b) State the Darcy's Law. How to measure the co efficient of permeability by use of Darcy's Law. **04**

(c) Ordinates of 8 hours UH for a drainage basin are given below. Obtain a 24 hr UH by analytical method. **07**

Time (Hr)	Ordinates of 8hr UH	Time (Hr)	Ordinates of 8hr UH
0	0.0	40	79.0
4	5.5	44	42.0
8	13.5	48	31.0
12	26.5	52	22.0
16	45.0	56	12.0
20	82.0	60	8.5
24	162.0	64	5.5
28	240.0	68	2.5
32	231.0	72	1.0
36	165.0	76	0

Q.4 **(a)** Differentiate between Low head power plants and High head power plants. **03**

(b) Write short note on Gravity Dam and Earth Dam. **04**

(c) Explain with a neat sketch the various zones of storage in a reservoir. **07**

OR

Q.4 **(a)** Discuss the various factors affecting for the site selection of a dam. **03**

(b) What are the procedures for determining the useful life of reservoir? **04**

(c) Explain briefly all components of a hydroelectric power plant with neat sketch. **07**

Q.5 **(a)** Write the short note on Levees and Flood walls. **03**

(b) Enlist the various types of Drought. Explain major causes of drought. **04**

(c) Explain theoretical probability distribution Gumbel's method. **07**

OR

Q.5 **(a)** Describe in brief Flood damage analysis. **03**

(b) What is mean by Water harvesting? Explain any one method of water harvesting. **04**

(c) Describe the Flood routing with neat sketch. **07**

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