

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. **07**
The time distribution of the storm is as follow. Estimate the w-index and Θ -index.

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 coefficient 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
