

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 711204N

Subject Name: Water Resources Engineering

Date: 04 /02 /2011

Time: 02.30 pm – 05.00 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) Explain factors affecting runoff 07
 (b) The observed hydrograph co-ordinates resulting from 3 –hour hydrograph are as mentioned below. Calculate the Unit hydrograph ordinates if the catchment area is 750 sq. Km. 07

Time in hours	0	2	4	6	8	10	12	14	16	18	20
Runoff in cumec	10	30	70	91	110	140	120	85	65	40	10

- Q.2** (a) Describe flood forecasting and warning methods 07
 (b) Derive Theims formula for unconfined aquifer 07
OR
 (b) A 25 cm diameter well penetrates 20m below water table . After 1 day pumping at a rate of 4600 liters/minutes .The water level in a test well at 110m is lowered by 0.7m and test well at 40m away drawdown is 1.25m what is the transmissibility of Aquifer 07

- Q.3** (a) Define W index and Φ index 07
 (b) The infiltration capacities of an area at different intervals of time are indicated below. Find an equation for the infiltration capacity 07

Time in Hours	0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
Infiltration capacity in cm.hr	8.4	7.5	7.1	6.5	4.9	3.8	3.3	2.0	2.0

OR

- Q.3** (a) From following data find out optimum numbers of rain gauge 07
 (i) Total number of observation station : 08
 (ii) Precipitation details : 314, 218, 250, 610, 250, 400, 324 and 410 mm
 (iii) Allowable error : 10%
 (b) Explain different method of flood estimation 07

- Q.4 (a)** Use Gumbles method to forecast flood for 100 years frequency if other data as below **07**

Return period	Peak flood m^3/s
35	310
50	406

- (b)** Explain (i) DAD curve (ii) Intensity duration Frequency curve **07**

OR

- Q.4 (a)** Unit hydrograph ordinates of 4 hour are given below . Find out ordinates of 8 hour unit hydrograph **07**

Time in hour	0	4	8	16	20	24	28	32	36	40
U.H.O	0	17	28	42	72	60	47	32	15	0

- (b)** Explain Hydrological cycle and discuss importance of water resources. Also discuss sources and uses of water **07**

- Q.5 (a)** Explain float recording rain gauge **07**

- (b)** Explain (i) Aquifer (ii) Artisan well (iii) Perched Aquifer (iv) Darcy's law **07**

OR

- Q.5 (a)** Explain Modified Puls method of flood routing **07**

- (b)** Explain factors affecting Evaporation **07**
