Paper Code: CE-035	**Roll No.**									

B.TECH.
SEVENTH SEMESTER EXAMINATION, 2016-17
ENGINEERING HYDROLOGY

[Time: 3 Hours] [Max. Marks: 100]

Note:

- *Attempt all questions.*
- *Marks and number of questions to be attempted from the section is mentioned before each section.*
- *Usual notations have been followed.*
- *Assume any data suitably, if required.*

1. Attempt any FOUR parts of the following:- **(5x4=20)**

(a) Describe 'hydrologic cycle' with the help of figure?
(b) Write down break up of total quantity of water available in the world and give distribution of fresh water on earth.
(c) Define precipitation and briefly describe various forms of precipitation.
(d) Describe functioning of 'Natural-Syphon type' raingauge.
(e) The ordinates of the rainfall mass curve of a storm as recorded by a recording raingauge at 8 hour intervals are 0.0, 22.0, 40.0, 80.0, 92.0, 100.0, 104.00 and 108.00 mm. Construct the hyetograph of this storm for a uniform interval of 15 minutes.
(f) A storm commenced at 7.00 hours. The ordinates of the rainfall mass curve of this storm in mm at 15 minute intervals are 0.0, 9.5, 17.0, 27.0, 40.5, 49.0, 63.0, 84.0, 95.0, 102.0, 110.0, 112.0 and 112.0. Compute the maximum rainfall intensity for duration of 180 minute.

2. Attempt any FOUR parts of the following:- **(5x4=20)**

(a) Explain factors affecting rate of evaporation.
(b) Describe functioning of pan evaporimeter specified by IS: 5973-1998.
(c) Differentiate between 'transpiration' and 'evapotranspiration'. How evapotranspiration is measured?
(d) What do you mean by 'initial loss'? Describe.
(e) Define 'infiltration process', 'infiltration capacity' and 'field capacity'.
(f) Explain process of measurement of infiltration.

3. Attempt any TWO parts of the following:- **(10x2=20)**

(a) (i) What do you mean by unit hydrograph? Explain the assumptions involved in unit hydrograph theory.
(ii) Define S- curve and explain how it is constructed.

(b) Ordinate of a 4-h unit hydrograph are given below:

Time(h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4-h unit hydrograph	0	20	80	130	150	130	90	52	27	15	5	0

Using this, derive a 2-h unit hydrograph for the same catchment.

(c) Explain (i) Synthetic unit hydrograph and (ii) Instantaneous unit hydrograph.

4. Attempt any TWO parts of the following:- **(10x2=20)**

(a) For a data of maximum recorded flood of a river, the mean and standard deviation are 4200 m^3/sec and 1705 m^3/sec respectively. Using Gumbels's extreme value distribution, estimate the return period of a design flood of 9550 m^3/s. Assume an infinite sample size.

(b) For a river the estimated flood peaks for two return periods by use of Gumbel's method are as follows:

Return period T(years)	Peak Period (m^3/sec)
50	30,800
100	36,300

Estimate the magnitude of a flood for this river with return period of 200 years.

(c) Explain the structural and non structural methods of flood control?

5. Attempt any TWO parts of the following:- **(10x2=20)**

(a) Develop the equation relating the steady state discharge from a well in an unconfined aquifer and depths of water table at two known positions from the well. State clearly all the assumptions involved in your derivation.

(b) A 30 cm well completely penetrates an unconfined aquifer of saturated depth 40 m. After a long period of pumping at a steady rate of 1500 lpm, the drawdown in two observations well 25 m and 75 m from the pumping well were found to be 3.5 m and 2.0 m respectively. Determine the transmissibility of the aquifer. What is the drawdown at the pumping well?

(c) Write short notes on following:-
- (i) Well efficiency
- (ii) Specific yield
- (iii) Forms of subsurface water
- (iv) Aquifer and aquitard