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Total Number of Pages : 02

B.Tech.
PECI5401

7th Semester Regular/Back Examination 2017-18

Water Resources Engineering

BRANCH : CIVIL

Time : 3 Hours

Max Marks : 70

Q.CODE : B338

**Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.**

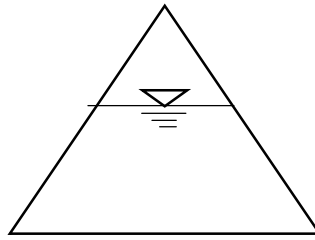
- Q1 Answer the following questions : (2x10)**
- a) What are the precautions to be taken in selecting site for the location of a rain gauge ?
 - b) Define *probable maximum precipitation*.
 - c) Differentiate between *perennial* and *ephemeral* stream.
 - d) What are the limitations of unit hydrograph theory?
 - e) What is the probability that 5 year flood will occur at least once during next 3 years?
 - f) As the rainfall supply continues, the rate of infiltration decreases, Why?
 - g) What is flood routing?
 - h) What is the philosophy of most economical sections?
 - i) What are the functions of jetties?
 - j) What is the importance of *specific energy diagram*?
- Q2 a) Explain Hydrologic Cycle with neat sketch. (5)**
- b) A 6 hr storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm/hr in successive one hour intervals in a basin of 800 sq.km. The resulting runoff is observed to be 2640 ha.m. Determine ϕ - index for the basin. (5)**
- Q3 a) Explain briefly the dilution method of flow measurement. List the qualities of a good tracer for use in this method. (5)**
- b) How do you measure evaporation using Pan and Water Budget Equation Method? (5)**
- Q4 a) In a 4 hr. storm with 50 mm of excess rainfall from a basin, the flows in the stream were as follows : (4+4)**

Time (hrs)	0	2	4	6	8	12	16	20
Flow (m³/s)	0	1.22	4.05	6.75	5.67	3.35	1.35	0

Determine the ordinates of unit hydrograph. Estimate the peak flow and the time of its occurrence in a flood created by a 8 hr storm, which results in 2.5 cm of effective rainfall during the first 4 hours and 3.75 cm of effective rainfall during the second 4 hours. Assume the base flow as negligible.

- b) What are the factors which affect the flood hydrograph? (2)**
- Q5 a) Write a brief note on frequency factor and its estimation by Gumbel's method. (5)**
- b) Differentiate between hydraulic and hydrological method of flood routing. (5)**

- Q6 a)** Derive Chezy's equation for open channel flow. (5)
b) Water is flowing a critical depth of a section in a triangle shaped channel with side slope of 0.5H:1V as shown in the figure. If the critical depth is 1.6m., estimate the discharge in the channel and specific energy at the critical depth. (5)



3.0m

- Q7** Describe the principal forces which act on a graving dock. Explain the basic information needed for designing of a breakwater? (10)
- Q8 Write short answer on any TWO:** (5 x 2)
- a)** Risk, reliability and safety factor
 - b)** Instantaneous unit hydrograph
 - c)** Gradual varied flow
 - d)** Evaporimeter