

Seat No.	
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**T.E. (Civil Engineering) (Part - I) (Semester - V) (New)  
Examination, December - 2015**

**WATER RESOURCES ENGINEERING - I**

**Sub. Code : 66235**

**Day and Date : Tuesday, 08 - 12 - 2015**

**Total Marks : 100**

**Time : 02.30 p.m. to 05.30 p.m.**

- Instructions :**
- 1) Attempt any three questions from each section.
  - 2) Assume any other suitable data, if necessary
  - 3) Figures to the Right indicate Full marks

**SECTION - I**

- Q1) a)** Describe the process of hydrological cycle with neat sketch. [6]
- b)** What are the factors affect the evaporation process and what are methods to reduce evaporation losses. [6]
- c)** Explain with sketches : [6]
- i) Weighing bucket type gauge;
  - ii) Tipping bucket type rain gauge

- Q2) a)** The ordinates of 2-h unit hydrograph of a basin are given below. Determine the ordinates of 4-h unit hydrograph using method of S-Curve. [8]

Time(h)	0	2	4	6	8	10	12	14	16	18	20	22
Ordinate (m <sup>3</sup> /s)	0	25	100	160	190	170	110	70	30	20	6	0

- b)** What is base flow? Explain the difference methods to separate it. [8]

**P.T.O.**

- Q3) a) Enumerate the different methods which are used for stream gauging. Discuss any one of these methods in detail. [6]
- b) Explain in brief various methods of estimation of peak flood. [6]
- c) Explain with neat sketch current meter. [4]
- Q4) Write short notes on (Any Four) : [16]
- a) Infiltration Indices.
- b) Factors affecting runoff.
- c) Methods of flood control.
- d) Double ring infiltrometer.
- e) Design flood and most probable flood.

### SECTION - II

- Q5) a) Derive an expression for discharge from a well in unconfined aquifer. The well fully penetrates it. [8]
- b) Explain the following term, : [8]
- a) Aquicludes
- b) Aquifers
- c) Perched aquifers
- d) Specific yield of aquifer
- Q6) a) Discuss in brief benefits and ill effects of irrigation. [6]
- b) Explain the terms 'duty' and 'delta'. Derive the relationship between the two. What are the factors affecting duty and how can duty be improved? [6]
- c) A field channel has cultivable commanded area of 2000 ha. The intensity of irrigation for gram is 30% and for wheat is 50%. Gram has a crop period of 18 days and a depth of 12 cm. While wheat has a crop period of 15 days and a depth of 15 cm. Calculate discharge of the field channel. [6]

- Q7) a) Explain with neat sketch a typical rooftop rainwater harvesting system adopted in rural area. [8]
- b) Explain with neat sketch the layout and working of percolation tank with advantages and disadvantages. [8]

Q8) Write short notes on (Any Four) : [16]

- a) Water shade management.
- b) Ground water recharge method.
- c) K.T Weirs.
- d) Crop season in Maharashtra.
- e) Soil conservation.

