

Seat No.	
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T.E. (Civil) (Semester - V) Examination, December - 2014

WATER RESOURCES ENGINEERING - I (New)

Sub. Code : 45538

Day and Date : Saturday, 13 - 12 - 2014

Total Marks : 100

Time : 2.30 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) What are the different types of precipitation.
- b) The rate of precipitation in mm/hr observed over a catchment of 30 km<sup>2</sup> for successive 30 min is as follows:
- 16, 20, 24, 36, 28, 12, 4.
- If the value of  $\phi = 22$  mm/hr, Find runoff in ha-m.
- c) Discuss the various factors which affect the runoff from a basin.
- d) Define hydrograph. Draw a single peaked hydrograph and indicate its various components.

[4 × 4]

- Q2) a) Define 'raingauge density' and explain how you would determine the optimum number of raingauges to be erected in a given basin. [8]

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- b) Write short notes on :
- Pan coefficient.
  - Supra rain.
  - Watershed leakage.
  - Dalton's law of evaporation.

- Q3) a) What is base flow? Explain the different methods to separate it. [6]
- b) Derive flood hydrograph from a 1 Hr unit hydrograph for the storm of excess rainfall of 2 cm/hr, followed by 4 cm/hr, then there is a gap of 1 hr & then 1 cm/hr. Assume constant base flow of  $5 \text{ m}^3/\text{s}$ . The 1 Hr unit hydrograph co-ordinates are as below :

Time (Hr)	0	1	2	3	4	5	6	7	8	9	10
Discharge ( $\text{m}^3/\text{s}$ )	0	6	13	22	16	11	7	4	2	1	0

- c) Explain : 'current meter rating curve'. How it is prepared? Sketch a typical rating curve. [4]

Q4) Write short notes on. (Any three) [18]

- Determination of average annual rainfall.
- S - curve hydrograph.
- Methods of flood control.
- Hydrology & water budget equation.

SECTION - II

Q5) a) Name the methods of distribution of water adopted for the following crops and describe the methods with sketches - [10]

i) Potato

ii) Orchard

iii) Paddy (In plain terrain)

b) A 30 cm. dia. Well completely penetrates an unconfined aquifer of depth 40 m. After a long period of pumping at a steady rate of 1500 liters per minute, the drawdown in two observation wells at 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. [8]

Q6) a) Write a short note on different crop seasons in India. Mention their month. Also give list of crops grown in each season. [5]

b) Explain the following terms - [5]

i) G.C.A.

ii) C.C.A.

iii) Outlet factor

c) A field channel has culturable commanded area of 2000 ha. The intensity of irrigation for gram is 30% and for wheat is 50%. Gram has a kor period of 18 days and kor depth of 12 cm. while wheat has a kor period of 15 days and a depth of 15 cm. Calculate the discharge of the field channel. [6]

- Q7) a) Explain with a neat sketch the layout and working of a Kolhapur type weir. [6]
- b) Explain with neat sketch the layout and working of percolation tanks. [6]
- c) Write a detailed note on contour farming method. [5]
- Q8) Write short note on any four of following --- [16]
- a) Factors affecting duty.
  - b) Measures to improve duty.
  - c) Groundwater recharge methods.
  - d) Land drainage arrangements.
  - e) Open wells - constructional features.
  - f) Tube wells - constructional features.

