Total No. of Questions :10]

SEAT No. :

**P3558**

[Total No. of Pages :2

# [5560]-501

## T. E. (Civil)

## HYDROLOGY AND WATER RESOURCES ENGINEERING

## (2015 Pattern) (Semester - I)

*Time : 2½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Answer Q.No.1or Q.No.2, Q.No.3 or Q.No.4, Q.No.5 or Q.No.6, No.7 or Q.No.8, Q.No.9 or Q.No.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

***Q1)*** a) State and explain applications of Hydrology. **[6]**

b) Write a note on sprinkler method of irrigation. Indicate the advantages and disadvantages of this method of irrigation. **[4]**

OR

***Q2)*** a) There are five rain gauges uniformly spread in a small area. The depth of rainfall observed and area of Theissen polygons for the corresponding rain gauges are given below. Determine average depth of precipitation. **[6]**

| Rain gauge No. | A | B | C | D | E |
|---|---|---|---|---|---|
| Rainfall depth (cm) | 50 | 40 | 47 | 50 | 49 |
| Area of Theissen Polygons (sq.km) | 90 | 106 | 98 | 91 | 100 |

b) An irrigation canal has gross command area of 50,000 hectares out of which 80% is irrigable. The intensity of irrigation for Kharif and Rabi season is 25% and 50% respectively. Find discharge require at the end of canal if the duty at its head is 750 hectares/cumecs for Kharif season and 1600 hectares/cumec for Rabi season. **[4]**

***P.T.O.***

***Q3)*** a) State and explain any two methods of Assessment of canal revenue. **[4]**

b) Derive an expression for discharge from a well fully penetrating confined Aquifer. **[6]**

OR

***Q4)*** a) Derive an expression for discharge from a well fully penetrating unconfined Aquifer. **[6]**

b) What is mean by Duty and Delta? Derive a relationship between Duty and Delta for a given Base period. **[4]**

***Q5)*** a) State and explain various methods of base flow separation. **[8]**

b) Explain S-Curve hydrograph with neat sketch. **[8]**

OR

***Q6)*** a) Given below are the observed flows from a storm of 6 hour duration on a stream with a drainage basin area of 380 sq km. Assume a constant base flow of 17 cumecs, derive ordinate of 6 hour duration unit hydrograph. **[8]**

| Time (hr) | 0 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow ($m^3/s$) | 17 | 100 | 250 | 190 | 160 | 100 | 98 | 75 | 55 | 48 | 32 | 25 | 17 |

b) What is runoff what are the factors that affect the runoff from a catchment. **[8]**

***Q7)*** a) Explain in brief various investigations required for reservoir planning. **[8]**

b) Discuss various methods of reservoir sediment control. **[8]**

OR

***Q8)*** a) What do you understand by mass curve and demand curve. **[8]**

b) Discuss the various types of storages in reservoir with sketch. **[8]**

***Q9)*** a) Explain the Cooperative water distribution systems. **[8]**

b) Explain causes and effects of water logging. **[10]**

OR

***Q10)***a) What is mean by Alkaline and Saline land. **[6]**

b) Describe various methods adopted as anti-water logging measures. **[12]**

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