

Total No. of Questions : 10]

SEAT No. : 

P3604

[Total No. of Pages : 3

[5153]-501

T.E. (Civil)

**HYDROLOGY AND WATER RESOURCES  
ENGINEERING  
(2012 Pattern)**

*Time : 3 Hours]**[Max. Marks : 70**Instructions to the candidates:*

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

- Q1)** a) Explain applications of hydrology. [5]  
b) Explain Thiessen's method to estimate mean precipitation. [5]

OR

- Q2)** a) State the formula to calculate optimum number of raingauges. Explain the terms in the formula. [5]  
b) State deltas for Gram, Maize, Sugarcane, Rice and cotton also explain methods to improve duty. [5]

- Q3)** a) Differentiate between sub-surface irrigation and sprinkler irrigation system. [5]  
b) Explain with neat sketch tipping bucket type gauge to determine the stage of river and also state the advantages of this gauge. [5]

OR

- Q4)** a) Derive the formula to calculate discharge of a well in a confined aquifer. [6]  
b) State various types of tube wells and explain construction of Slotted Type Tube well. [4]

**P.T.O.**

- Q5) a)** What is hydrograph? Explain all the parts of the typical hydrograph. Explain fern shaped catchment. [8]
- b)** Maximum values of 24 hour precipitation (mm) at a Rainguage station are 140, 113, 132, 115, 130, 118, 127, 123, 121. Estimate maximum and minimum precipitation having a recurrence interval of 5 and 15 years. Use Hazen's Method. Use graphical method. [10]

OR

- Q6) a)** What is S-curve hydrograph? Explain its construction with sketch.[8]
- b)** In a 10 hr storm rainfall depths occurred over a the catchment are [10]

Hour	1	2	3	4	5	6	7	8	9	10
Depths (cm/hr)	1	1.5	5	6	10.5	8.5	9	7	1.5	1.5

Surface runoff resulting from the storm is equivalent to 20 cm of depth over the catchment. Determine

- i) Average infiltration,
- ii) Average rate of infiltration
- Q7) a)** Explain how will you fix the capacity of reservoir using annual inflow and outflow. [8]
- b)** Explain fixation of reservoir capacity using elevation capacity curve and dependable yield. [8]

OR

- Q8) a)** What are various reservoir losses? What are various measures to control these losses. [8]
- b)** What is reservoir sedimentation? What is the significance of trap efficiency? Explain with neat sketch. [8]
- Q9) a)** Write a note on ancient system of water distribution which still exist in North Maharashtra. [8]
- b)** Explain Global Water Partnership (GWP). [8]

OR

- Q10)**a) What is water logging? Explain tile drain method and also state formula for spacing of tile drains. [8]
- b) Draw a neat section for lift irrigation scheme and state various components of lift irrigation scheme. Explain various design steps in lift irrigation system. [8]

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