

Total No. of Questions : 12]

P745

SEAT No. :

[Total No. of Pages : 4

[4263] - 206

T.E. (Civil Engineering)

HYDROLOGY AND WATER RESOURCES ENGINEERING

(Semester-II) (2008 Pattern)

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) Answer three questions from Section-I and three questions from Section-II*
- 2) Answers to the two sections to be written in separate answer books.*
- 3) Figures to the right indicate full marks.*
- 4) Draw neat diagrams wherever necessary.*
- 5) Use of calculators is allowed*
- 6) Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What is meant by Probable Maximum Precipitation? Describe the methods of estimating PMP. What are its design applications? [10]
- b) Describe the principle of working of a tipping bucket type recording rain gauge with neat sketch. Mention its advantages and disadvantages. [8]

OR

- Q2)** a) What is evaporation? How will you measure it? Draw neat labelled sketch of field method to measure evaporation. State methods to control evaporation loss from reservoir. Explain any one method in detail.[10]
- b) What is stream gauging? Explain dilution technique method with sketch and explain its application in water resources engineering [8]

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- Q3)** a) Explain extreme value (Gumbel's) distribution [8]
b) State various formulae to estimate flood and explain any two methods [8]

OR

- Q4)** a) What do you understand by return period? Give few formulae to determine return period. [8]
b) Given below are the ordinates of a 4 h UH of a basin in m^3/s at 1 hour interval. 4, 25, 44, 60, 70, 61, 52, 45, 38, 32, 27, 22, 18, 14, 11, 08, 06, 4, 2 and 1. What is the area of basin? [8]

- Q5)** a) Explain types of reservoirs and explain the points considered for selecting the site for a reservoir and state the investigation required for construction of a reservoir, [8]
b) What is design life period of storage reservoir? How do you account for sediment deposition in the reservoir while fixing its storage capacity? [8]

OR

- Q6)** a) Define trap efficiency of reservoir. Describe how the time required to for the reservoir to fill up with the sediments is calculated. [8]
b) Write a note on Benefit-Cost studies for reservoir. Explain any two methods. [8]

SECTION - II

- Q7)** a) Explain any two methods of assessing canal revenue [8]
b) Explain sprinkler irrigation with a neat layout sketch and state the advantages of sprinkler irrigation over other methods of irrigation. [8]

OR

Q8) a) Explain the relation between duty, delta and base period. Derive the relation between them and states the methods to improve duty of water. [8]

b) Define

- i) Kor watering,
- ii) Kor depth,
- iii) Paleo irrigation,
- iv) Crop period,
- v) Base period,
- vi) Intensity of irrigation,
- vii) Gross command area,
- viii) Culturable command area.

[8]

Q9) a) Explain Dupits and Thiems theory and state the assumptions made [8]

b) Enlist different types of tube wells and dug wells and explain strainer type with a neat sketch [8]

OR

Q10) a) Explain pumping and recuperation test. What should be the diameter of an open well to give safe yield of 5 lit/sec? Assume the working head at 3.75 m and the subsoil consists of fine sand. (For fine sand specific yield = 0.5/hour). [8]

b) In an artesian aquifer of 10 m thick, a 10 cm diameter well is pumped at a constant rate of 100 lit/minute. The steady state drawdown observed in two wells located at 10 m and 50 m distances from the centre of the well are 3 m and 0.05 m respectively, compute the transmissivity and the hydraulic conductivity of the aquifer. [8]

Q11) a) What is lift irrigation scheme. Explain the investigations necessary and approvals required for its implementation. State the design considerations for the components of lift irrigation scheme. [12]

b) Write a note on ancient system of water distribution [6]

OR

Q12) a) What are co-operative water distribution society's. State the rules and regulation laid down by these societies for equitable distribution of water to farmers. [10]

b) What is water logging? What are the ill effects of water logging? Explain any one method to improve the sub-surface drainage [8]

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