

Total No. of Questions : 8]

SEAT No. :

P-7505

[Total No. Of Pages : 3

[6180]-12

T.E. (Civil Engineering)

WATER SUPPLY ENGINEERING

(2019 Pattern) (Semester - I) (301002)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Neat diagrams must be drawn wherever necessary.
- 2) Use of Calculator is allowed.
- 3) Assume Suitable data if necessary.
- 4) Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8

Q1) a) Differentiate between coagulation and flocculation by considering different points. [6]

b) A clariflocculator is to be designed for an average flow of 50 MLD. Assuming, inlet velocity as 1.2 m/s, and detention time in flocculator and clarifier as 30 min and 120 mins, respectively, surface overflow rate in clarifier as $40 \text{ m}^3/\text{m}^2/\text{d}$, G in flocculator 40 s^{-1} , and depth of flocculator basin as 2.5 m, determine diameter of inlet pipe, flocculator and clarifier. [6]

c) Discuss in details various mechanisms involved in the filtration process. [6]

OR

Q2) a) What is Flocculation? State factors affecting the flocculation. [6]

b) A filter unit is of size $4\text{m} \times 8\text{m}$. After filtering $8000 \text{ m}^3/\text{day}$ in 24 hr period, the filter is back washed for 30 minutes at the rate of $10 \text{ lit}/\text{m}^2/\text{sec}$ for 10 minutes. Compute the average filtration rate, quantity and percentage of treated water used in washing and the rate of wash water flow in each trough. The unit has 4 collecting troughs. [6]

c) Explain in detail: operational problems of RSG filter. (Min 03 to be explained) [6]

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- Q3) a)** Enlist various methods of disinfection. Explain any two methods in detail. [6]
- b) What is Residual Chlorine? Find the dose of chlorine and chlorine demand for water quantity of 40,000 m³/day. Chlorine used is 15 kg per day and residual chlorine after 10 minutes of contact time is 0.2 mg/ lit. [6]
- c) Write with a neat sketch, a detailed note on Reverse Osmosis [2 + 3 = 5]

OR

- Q4) a)** Explain in detail: fluoridation & defluoridation of water. [6]
- b) Explain in detail: Super chlorination, Dechlorination, Prechlorination [6]
- c) Write with a neat sketch: a detailed note on Electrodialysis. [2 + 3 = 5]
- Q5) a)** Write in detail: any 02 methods of water distribution. Support your answer with a suitable sketch. [8]
- b) Designed demand of a town is 3 MLD. It is pumped into an elevated service reservoir at a uniform rate from 5 am to 9am and 5pm to 9pm. The variation in demand of water is given below. [10]

Period	5 am to 9 am	9 am to 5 pm	5 am to 9 pm	9 am to 12 am	12 am to 5am
demand	40%	15%	30%	10%	05%

Determine the balancing Capacity of the reservoir.

OR

- Q6) a)** Write difference between continuous and intermittent system. (Min 06 points of comparison are expected) [6]
- b) Calculate the storage capacity and dimensions of the tank to store rain water for the given data: [6]
- Terrace area = 200 m², average annual rainfall = 720 mm
- Runoff coefficient = 0.8, Assume L:B = 2, D = 2m
- c) Write a detailed note on detection and prevention of leakage. [6]

- Q7)** a) Write a note on: 1) Gate valve, 2) Pressure relief valve [6]
- b) Explain in detail Packaged WTP [5]
- c) Explain with neat sketch: one pipe system partially ventilated. [6]

OR

- Q8)** a) Write a note on: 1) Reflux valve, 2) Air relief valve [6]
- b) Explain in detail with neat sketch: two pipe system. [5]
- c) Enlist initiatives taken by Government in water infrastructure. Explain one of them in detail. [6]

