

Total No. of Questions : 8]

SEAT No. :

P251

[Total No. of Pages : 2

[6003]-328

T.E. (Civil Engineering)

WATER SUPPLY ENGINEERING
(2019 Pattern) (Semester-I) (301002)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicates full marks.
- 4) Use of calculator is allowed.
- 5) Assume suitable data if necessary.

- Q1)** a) Explain in detail: Rapid Mixer and flocculator. [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 40s^{-1} , and depth of flocculator basin as 2.5m, 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]

- 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 $40,000\text{ m}^3/\text{day}$. Chlorine used is 15 kg per day and residual chlorine after 10 minutes of contact time is $0.2\text{ mg}/\text{lit}$. [6]
c) Write with a neat sketch a detailed note on Reverse Osmosis. [2+3=5]

OR

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- 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 pm to 9 pm	9 pm to 12 am	12 am to 5 am
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 point of comparison are expected) [6]
 b) Calculate the storage capacity and dimensions of the tank to store rain water for the given data:
 Terrace area= 200 m², average annual rainfall=720 mm
 Runoff coefficient= 0.8 Assume L:B=2, D=2m [6]
 c) Write a detailed note on detection and prevention of leakage. [6]

- Q7)** a) Write a note on: [6]
 i) Gate valve,
 ii) Pressure relief valve
 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: [6]
 i) Reflux valve,
 ii) Air relief valve
 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]

