

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  $40\text{s}^{-1}$ , 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

*P.T.O.*

- 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 m<sup>2</sup>, 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]

