

Reg. No. :

Question Paper Code : 80211

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Civil Engineering

CE 6503 — ENVIRONMENTAL ENGINEERING — I

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Design Period.
2. What are the components of public water supply scheme?
3. List functions of intake structure.
4. What are the different types of settling?
5. Differentiate between unit operations and Processes?
6. Distinguish between coagulation and flocculation?
7. What are the methods for Defluoridation?
8. How to remove iron from water?
9. What is the function of service reservoir?
10. What are the different methods of leak detection in a water distribution network?

PART B — (5 × 16 = 80 marks)

11. (a) (i) The population of 5 decades from 1930 to 1970 are given in table. Find out the population after one, two and three decades beyond the last known decade by any 3 methods? (10)

Year :	1930	1940	1950	1960	1970
Population :	25000	28000	34000	42000	47000

- (ii) Discuss the various factors that influence the water demand of a community. (6)

Or

- (b) (i) Explain Membrane filter technique. (8)
- (ii) What are the factors to be considered in the selection of source for a water supply scheme? How does the quality of ground water differ from surface water? (8)
12. (a) (i) In a water supply scheme to be designed for serving a population of 4 lakhs, the storage reservoir is situated at 8 km away from the city and the loss of head from source to city is 16 metres. Calculate the size of supply main by using Weisbach formula as well as Hazen's formula assuming a maximum daily demand of 180 litres per day per person and half of the daily supply to be pumped in 8 hours. Assume the coefficient of friction for the pipe material as 0.012 in Weisbach formula and $C_H = 130$ in Hazen's formula. (10)
- (ii) Explain the factors to be considered for selection of pumps. (6)

Or

- (b) (i) Explain the working of a reservoir intake with a neat sketch. (8)
- (ii) Explain briefly the steps involved in water supply pipeline installation. (8)
13. (a) (i) How many kg of bleaching powder with 25% available chlorine is required daily to treat 5 MLD of water with 3 mg/L of chlorine? (6)
- (ii) With the help of neat sketch explain function and operation of slow sand filter. (10)

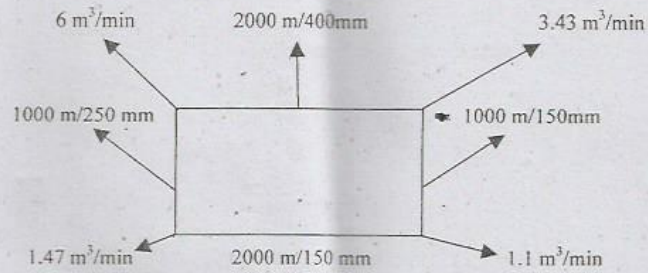
Or

- (b) (i) Explain the design principles of flash mixer and flocculator. (8)
- (ii) Design a clarifier for a population of 60000 persons. Per capita demand is 150 Lpcd. Peak demand 180% of average demand. Assume suitable data if necessary. (8)

14. (a) Explain the different methods of Water softening. (16)

Or

- (b) Write a note on :
- (i) Prasanthi techniques (5)
 - (ii) Reverse osmosis (5)
 - (iii) Nalgonda technique. (6)
15. (a) Analyse the pipe network shown below and tabulate the flow values in each of pipe. (16)



Or

- (b) (i) Enumerate some of the appurtenances required for the pipes of water distribution networks. (10)
- (ii) What are the requirements of good distribution system? (6)