

04 JAN 2022

Reg. No.

Question Paper Code

11544

**B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022**

Fifth Semester

**Civil Engineering**

**20CEPC502 - PUBLIC HEALTH AND SANITATION ENGINEERING**

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |   | <i>Marks,<br/>K-Level, CO</i> |
|---|-------------------------------|
| 1. Define per capita demand.  | 2,K1,CO1                      |
| 2. Define fire demand and suggest any two methods to calculate it.              | 2,K1,CO1                      |
| 3. What are intakes?  | 2,K1,CO2                      |
| 4. Discuss the factors which contribute corrosion.                              | 2,K1, CO2                     |
| 5. List out four coagulants used in treatment of water.                         | 2,K1, CO3                     |
| 6. Describe about the term water softening.                                     | 2,K1, CO3                     |
| 7. Illustrate the different factors which affect the characteristics of sewage. | 2,K2, CO4                     |
| 8. What are the essential components of activated sludge process?               | 2,K1, CO4                     |
| 9. Give the significance of oxygen sag curve.                                   | 2,K2, CO5                     |
| 10. Define sludge bulking.  | 2,K1, CO5                     |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) The population of five decades from 1930 to 1970 is given in table. Find out the population after one, two and three decades beyond the last known decade by any three methods. 13,K2,CO1

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

**OR**

- b) What are the factors to be considered in the selection of pipe material for water transmission? Explain any four pipes used for conveyance of water. 13,K2,CO1
12. a) Explain in detail the principle, components and working of Rapid sand filters. 13,K2,CO3

**OR**

*K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create*

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b) What are the systems of plumbing? With the help of a neat sketch discuss various systems of plumbing used for drainage. Discuss about its advantages and disadvantages. 13,K2,CO

13. a) Calculate the velocity of flow and corresponding discharge in circular sewer having diameter of 1 m laid at a gradient of 1 in 400. The sewer is running at 0.5 m depth. Take  $N=0.012$  in Manning's formula. 13,K2,CO

**OR**

b) Define activated sludge process with their operation including advantages and disadvantages. 13,K2,CO4

14. a) Illustrate with a sketch the different types of pipe appurtenances used in Water Supply Project. 13,K2,CO3

**OR**

b) Classify the types of intakes. Also explain the working of a reservoir intake with a neat sketch. 13,K2,CO2

15. a) Draw a typical oxygen sag curve and explain its meaning and state its importance. 13,K2,CO5

**OR**

b) Derive Streeter Phelps equation to explain the relation between BOD, re-oxygenation and re-aeration. 13,K2,CO6

**PART - C (1 × 15 = 15 Marks)**

16. a) Discuss the need for sludge dewatering and explain the various sludge dewatering methods. 15, K2,CO2

**OR**

b) Discuss in detail the various methods adopted for disposal of sludge. 15,K2,CO4