

Register No.: ..... Name: .....

## SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**SIXTH SEMESTER B.TECH DEGREE EXAMINATION (S), AUGUST 2023**

**CIVIL ENGINEERING**

**(2020 SCHEME)**

**Course Code : 20CET304**

**Course Name: Environmental Engineering**

**Max. Marks : 100**

**Duration: 3 Hours**

### PART A

*(Answer all questions. Each question carries 3 marks)*

1. Explain population equivalent. What is its significance?
2. Describe design period for a water treatment plant.
3. Explain Stoke's law.
4. What is the purpose of providing clariflocculator in water treatment plant?
5. List out various methods for disinfection of water.
6. What are the advantages of rapid sand filters?
7. Draw the layout of conventional wastewater treatment plants.
8. What is the importance of providing flow equalization tank?
9. What is the difference between sludge thickening and sludge digestion?
10. Explain the working of oxidation ponds.

### PART B

*(Answer one full question from each module, each question carries 14 marks)*

#### MODULE I

11. a) Explain in detail about water intake structures with neat sketches. (9)  
b) What is dry weather flow? What are the factors affecting dry weather flow? (5)

#### OR

12. a) Explain in detail about various sewerage systems. Write advantages and disadvantages of all systems. (10)  
b) Compare pressure flow and gravity flow systems adopted for water conveyance. (4)

#### MODULE II

13. a) Illustrate the purpose of providing screens in treatment plants. Explain the different types of screens with neat sketches. (8)  
b) What are the different types of settling? (6)

**OR**

14. A rectangular sedimentation tank without mechanical equipment is to treat 1.8 MI/day of raw water. The sedimentation period is to be 4 hrs, velocity of flow 8 cm/min, depth of water and sediment is 4.2 m. If an allowance of 1.2 m for sediment is made, what should be; (14)
- a) Length of tank
  - b) Width of basin

**MODULE III**

15. Design a rapid sand filter to treat 4 million litres of raw water per day allowing 4% of filtered water for backwashing. Half hour per day is used for backwashing. Assume necessary data. (14)

**OR**

16. a) Explain in detail about -Hardy cross and equivalent pipe methods of water distribution network design. (10)
- b) What are the different types of chlorination? (4)

**MODULE IV**

17. a) What are the different stages of waste water treatment systems? Explain the various process in each stage. (8)
- b) Explain the working of activated sludge treatment system with neat sketch. (6)

**OR**

18. Explain the mechanism of functioning of a trickling filter plant with a neat sketch and also explain its advantages and disadvantages. (14)

**MODULE V**

19. a) Explain the working of UASB with neat diagram. (6)
- b) Explain in detail about low cost sanitation systems. (8)

**OR**

20. What is the significance of sludge treatment? What are the different sludge treatment processes? Explain in detail. (14)

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