Printed Pages: 02

Time: 3 Hours

Paper Id: 100261

B. TECH. (SEM-VI) THEORY EXAMINATION 2018-19 **ENVIRONMENTAL ENGINEERING**

Roll No.

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

- What is a design period? a.
- Write the name of common impurities found in water. b.
- Name the different pipe appurtenances. c.
- Explain BOD and COD. d.
- Enumerate the total amount of solid waste present in water. e.
- Calculate one day 37^oC BOD of sewage sample whose 5 days BOD is 100mg/l. f.
- What are the effects which occur on water after filtration? g.

SECTION B

2. Attempt any *three* of the following:

- What are the various methods to forecast the population growth in an area? a. Explain suitability of any four methods.
- b. A storage reservoir is situated at a distance of 6 km from a city of 3 lakh population. The total loss of head from the source to the city is not exceed 20 m. taking the daily demand of 200 l/capita/day, pumping is to be done for 12 hours only, determine the size of supply main by
 - i. Darcy – Weisbach formula taking coefficient of friction as 0.015
 - ii. Hazen Williams formula taking C = 130. Assume minor losses = 10 $V^{2}/2g$.
- Explain the importance of determining solids dissolved in water. How do you c. determine the amount of solids dissolved in waste water.
- Write the equation for temperature dependence of BOD. If the BOD₅ of a waste d. is 103 mg/L and the BOD₂₀ (corresponds to the ultimate BOD) is 160 mg/L, what is BOD rate constant?
- Elaborate the various water supply systems with reference to Indian context. e.

SECTION C

3. Attempt any one part of the following:

- The average sewage flow from sewage is 80 $\times 10^6$ L/D. If the average 5 day (a) BOD is 285 mg/l. Calculate the total 5 day oxygen demand in kg and population equivalent of sewage. Assume per capita demand of BOD per day is 75 g.
- Write a note on various shapes of sewer sections. (b)

4. Attempt any one part of the following:

- (a) Explain in detail absorption and ion exchange process of treatment of waste water.
- Discuss in detail the ways to remove hardness of waste water and the chemicals (b)

 $2 \ge 7 = 14$

 $7 \ge 3 = 21$



 $7 \times 1 = 7$

Total Marks: 70

Sub Code: RCE 602

^{1 |} Page

involved in hardness.

5. Attempt any *one* part of the following:

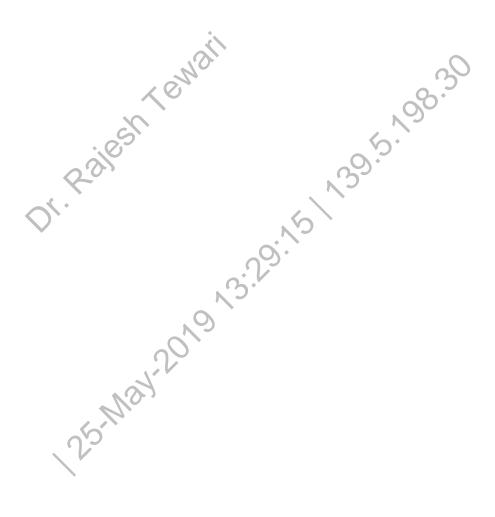
- (a) Why are coagulants used in waste treatment? List various coagulants used in the process.
- (b) A stone-ware sewer, 30 cm in diameter is laid at a gradient of 1 in 100. Using N = 0.013 in manning's formula, calculate the velocity and discharge when sewer is running full.

6. Attempt any *one* part of the following:

- (a) What do you understand by per capita demand? How is per capita demand for a community estimated? Also explain the factors which affect the per capita demand.
- (b) Explain activated sludge treatment in detail.

7. Attempt any *one* part of the following:

- (a) What are gravity and pressure conduits? Why pressure conduits are most commonly used for conveying water from distant sources to the town for supply?
- (b) What are the main sources of water pollution in industrial township?



 $7 \ge 1 = 7$

 $7 \times 1 = 7$

 $7 \times 1 = 7$