ACHARYA INSTITUTE OF TECHNOLOGY
Bangalore - 560090

USN | | | | | | | | | | |

10CV71

Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017
Environmental Engineering – II

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer FIVE full questions, selecting at least TWO questions from each part.***
2. ***Assume missing data suitably.***

PART – A

1 a. Explain the different types of sewerage systems with their merits, demerits and suitability. **(08 Marks)**

b. Explain the factors affecting dry weather flow. **(06 Marks)**

c. A certain district of a city has a projected population of 50,000 residing over an area of 40 hectares. Find the desired discharge for the sewerline for the following data:
i) Rate of water supply = 200 lit per capita per day.
ii) Average impermeability coefficient for the entire area = 0.3
iii) Time of concentration = 50 minutes.
A sewerline is to be designed for a flow equivalent to the wet weather flow plus twice the DWF. Use U.S. ministry of health formulae. Assume that 75% of water supply reaches in sewer as wastewater. **(06 Marks)**

2 a. Briefly explain self cleansing velocity and non scouring velocity with their values. **(06 Marks)**

b. Explain the desirable characteristics of a sewer material. List the sewer materials commonly used. **(08 Marks)**

c. A stoneware sewer 30 cm in diameter is laid at a gradient of 1 in 100 using N = 0.013 in Manning's formulae, calculate the velocity, discharge and Chagy's coefficient when the sewer is running full. **(06 Marks)**

3 a. Explain with a neat sketch, working of a deep manhole. **(08 Marks)**

b. Write the basic principles of home drainage systems. **(06 Marks)**

c. Write a note on sewer ventilation and cleaning of sewers. **(06 Marks)**

4 a. Explain different types of sampling. **(06 Marks)**

b. Write a note on nitrogen cycle. **(06 Marks)**

c. Define BOD and COD. Determine ultimate BOD for a sewage having 5-day BOD at 20°C as 160 mg/l. Assume deoxygenation content as 0.2 per day. **(08 Marks)**

PART – B

5 a. Briefly explain factors affecting self purification process. **(08 Marks)**

b. Explain with a neat sketch, the salient features of oxygen sag curve. **(06 Marks)**

c. Write short notes on:
(i) Sewage sickness (ii) Sewage farming. **(06 Marks)**

6 a. Explain with a flow diagram, a conventional sewage treatment plant. Discuss the function of each component. **(08 Marks)**

b. Explain different types of screen. **(06 Marks)**

c. Design a primary settling tank of rectangular shape for a town having a population of 50,000 with a watersupply of 180 litres per capita per day. **(06 Marks)**

7 a. With the help of a neat sketch, explain the working of trickling filter. **(10 Marks)**
b. Mention the modification of activated sludge process. Explain any two of them. **(10 Marks)**

8 a. With the help of neat sketch, explain working of sludge drying beds. **(10 Marks)**
b. Write short notes on:
i) Mechanism of anaerobic sludge digestion.
ii) Oxidation ditches. **(10 Marks)**

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