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# PRESIDENCY UNIVERSITY
# BENGALURU

## SCHOOL OF ENGINEERING
## MID TERM EXAMINATION - APR 2023

**Semester :** Semester VI - B.Tech CIV - 2020

**Date :** 15-APR-2023

**Time :** 2:00PM -3:30PM

**Course Code :** CIV3035

**Course Name :** Sem VI - CIV3035 - Waste Water Treatment and Disposal Systems

**Max Marks :** 60

**Program :** B.Tech. Civil Engineering

**Weightage :** 30%

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**Instructions:**
*(i) Read all questions carefully and answer accordingly.*
*(ii) Question paper consists of 3 parts.*
*(iii) Scientific and non-programmable calculator are permitted.*
*(iv) Do not write any information on the question paper other than Roll Number.*

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### PART A

**ANSWER ALL THE TWO QUESTIONS** **2 X 5 = 10M**

**1.** The surface on which rain falls in a district is classified as follows: 20% of the area consists of roofs for which the runoff ratio is 0.9, 20% of the area consists of pavements for which the runoff ratio is 0.85, 5% of the area consists of paved yards of houses for which runoff ratio is 0.8, 15% of area consists of macadam roads for which runoff ratio is 0.40, 35% of the area consists of lawns, gardens and vegetable plants for which the runoff ratio is 0.10 and the remaining 5% of the area is wooded for which the runoff ratio is 0.05. The total area of the district is 36 hectares and the max rain intensity is 5cm/hr. What is the total runoff for the district?

(CO1) [Knowledge]

**2.** Municipal wastewater generated from Yelahanka town is primarily organic in nature with little amount of oil and grease produced from automobile industries and contains high concentration of floating, grit and suspended particles. Draw a flow chart of various treatment units required for the treatment of wastewater produced from the town.

(CO2) [Knowledge]

## PART B

**ANSWER ALL THE THREE QUESTIONS** **3 X 10 = 30M**

**3.** A town has a population of 36000 with the daily per capita water supply allowance being 135 litres, of which 80% finds its way to sewer. The slope available for the sewer to be laid is 1 in 625 and sewer should be designated to carry four times the dry weather flow when running full. Estimate the velocity and diameter of the sewer when running full?
Take n = 0.012 in manning's formula.

(CO1) [Comprehension]

**4.** Waste water generated from residential area near Hebbal contains high concentration of oil and grease which will interfere with removal of organic matter in secondary treatment. Suggest a suitable preliminary treatment unit which can be used to remove oil and grease from waste water. Explain the working principle of suggested treatment unit with the help of neat diagram.

(CO2) [Comprehension]

**5.** Sampling is used every day at water and wastewater treatment plants to determine the characteristics of the water. Sampling may be used to test the finished water for regulatory purposes - to ensure that the treatment plant is treating the water in compliance with regulations. Discuss the various sampling techniques to collect water and wastewater.

(CO1) [Comprehension]

## PART C

**ANSWER THE ONE QUESTION** **1 X 20 = 20M**

**6.** Sewers are generally circular pipes laid below ground level, slopping continuously towards the outfall. These are designed to flow under gravity. Identify the factors to be Considered for Selecting Material for Sewer and Illustrate the different shapes of sewer.

(CO1) [Application]