Name: **Enrolment No:**	

UPES

End Semester Examination, May 2023

Course: Water Supply, Sanitation and Refugee Health — **Semester: VI**

Program: B.Tech. Fire & Safety Engineering — **Time: 03 hrs.**

Course Code: HSFS 3014P — **Max. Marks: 100**

Instructions: <u>All questions are compulsory.</u>

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	a. Define the terms: a. Water Supply System & b. Coincident Draft. b. The total draft for a city is: i. Maximum of Average daily draft and Maximum hourly draft ii. Minimum of Average daily draft and Maximum hourly draft iii. Maximum of Maximum hourly draft and Coincident draft iv. Minimum of Maximum hourly draft and Coincident draft	**04**	**CO1**
Q 2	Enlist the various components of sanitation.	**04**	**CO3**
Q 3	State the key differences between old turbidimeters and modern turbidimeters.	**04**	**CO1**
Q 4	Determine the peak sewage discharge generated from the town with a population of 1,00,000 and average sewage discharge as 5 MLD.	**04**	**CO2**
Q 5	State the various chemical parameters of raw water.	**04**	**CO1**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Examine the relevance of "overflow rate" in designing a continuous-type sedimentation tank. OR Explain the disinfecting action of chlorine in water treatment with critical points.	**10**	**CO1**
Q 7	Discuss the important considerations for design and planning of a sewerage system in a city.	**10**	**CO2**

<table>
<tr><td>Q 8</td><td>Explain the various factors/conditions that affects the health of migrants/refugees.</td><td>10</td><td>CO3</td></tr>
<tr><td>Q 9</td><td>Describe sequentially the different processes of wastewater treatment along with their function/purpose.</td><td>10</td><td>CO2</td></tr>
<tr><td colspan="4">SECTION-C
(2Qx20M=40 Marks)</td></tr>
<tr><td>Q10</td><td>Estimate the peak drainage discharge generated from a catchment area of 120 hectares and maximum rainfall depth is 25 cm obtained in 5 hours rainfall. The classification of the surface of the area is as follows:

<table><tr><th>Percent of total surface area</th><th>Type of surface</th><th>Coefficient of runoff</th></tr><tr><td>35</td><td>Roofs</td><td>0.96</td></tr><tr><td>20</td><td>Pavements</td><td>0.82</td></tr><tr><td>30</td><td>Macadam roads</td><td>0.51</td></tr><tr><td>15</td><td>Lawns</td><td>0.12</td></tr></table>
OR

Design a sanitary sewer to serve a population of 1,50,000 with the daily per capita water supply allowance of 140 liters. The slope available for the sewer to be laid is 1 in 800 with n=0.013. The dry weather flow may be taken as 1/4 of the maximum discharge. Determine the velocity of flow when sewer is running full.</td><td>20</td><td>CO4</td></tr>
<tr><td>Q11</td><td>Explain the working principle of filters in raw water treatment.
Design a rapid sand filter for the treatment of raw water for a town with population of 120000 and average daily water demand of 115 lpcd. Assume suitable data and figures wherever needed according to design guidelines.</td><td>07

13</td><td>CO4</td></tr>
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