PAPER ID-420692

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VI) THEORY EXAMINATION 2021-22
ENVIRONMENTAL ENGINEERING

Time: 3 Hours ***Total Marks: 100***

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

SECTION A

1. Attempt *all* questions in brief. 2*10 = 20

Qno	Questions	CO
(a)	Define "per capita demand"?	1
(b)	Define "Design Period"?	1
(c)	Explain the function of distribution reservoir.	2
(d)	What is 'Reservoir yield'?	2
(e)	What guidelines EPA has set for suspended solids?	3
(f)	Define 'dissolved material'?	3
(g)	Differentiate between Unit Operation & Unit Process?	4
(h)	What is the difference between "Disinfection" & "Sterilization"	4
(i)	Explain Aerobic decomposition?	5
(j)	Define wastewater treatment?	5

SECTION B

2. Attempt any *three* of the following: 10*3 = 30

Qno	Questions	CO
(a)	Explain the suitability of any four population forecasting methods?	1
(b)	Explain with neat sketch any one type of surface reservoir?	2
(c)	Explain in detail about organics in wastewater?	3
(d)	A rectangular settling tank is to treat 1.8 million litres per day of raw water. The sedimentation period is to be 4 hours, the velocity of flow 8 cm/minute, and the depth of the water and sediment 4.2 m. If an allowance of 1.2 m for sediment is made, what should be Length and Width of the basin.	4
(e)	Briefly explain the working of Trickling Filter?	5

SECTION C

3. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	The population of a city obtained from the census report is as given below: Year: 1960 | 1970 | 1980 | 1990 | 2000 Population: 80000 | 120000 | 168000 | 228000 | 250000 Calculate the population of the city for the year 2030 by Arithmetical increase method, geometric increase method and by Incremental Increase method.	1

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(b)	Estimate the hydraulic gradient in 2 m dia. Smooth concrete pipe carrying a discharge of 3 cumecs at 10^0C temperature by (a) Darcy-Weisbach formula (b) Hazen-William's formula. Assume all suitable data	1

4. Attempt any *one* part of the following: 10 *1 = 10

Qno	Questions	CO
(a)	Illustrate with sketches the different types of layouts of pipe systems in distributing water?	2
(b)	Differentiate between gravity and pressure conduits? Pressure conduits are commonly used for conveying water from distant sources to the town for supply, explain why?	2

5. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	A sample of wastewater has a 4- day 20^0C BOD value of 75% of final. Find the reaction constant per day?	3
(b)	For a wastewater sample, 5 -day BOD at 20^0C is 200 mg/lt and is 67% of the ultimate. What will be 4-day BOD at 30^0C	3

6. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Determine the quantity of alum required in order to treat 13 million litres of water per day at a treatment plant, where 12 ppm of alum dose is required. Also determine the amount of CO_2 gas which will be released per litre of water treated.	4
(b)	It is required to supply water to a population of 20,000 at a per capita demand of 150 lpcd. The disinfection used for the chlorination is bleaching powder which contains 30% available chlorine. Determine how much of bleaching powder is required annually at the water works of 0.3 ppm of chlorine dose is required for disinfection	4

7. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Discuss Activated Sludge process with suitable diagram.	5
(b)	Explain "Vermicomposting" in brief. Also explain advantages of Vermicomposting	5