JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech 5th Semester (CE)

COURSE CODE (CREDITS): 18B11CE512 (3) MAX. MARKS: 25

COURSE NAME: Sewage Treatment and Disposal

COURSE INSTRUCTORS: Dr. Rishi Rana Kalia MAX. TIME: 1 Hour 30 Minutes

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Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	A main combined sewer was designed to serve an area of 60 sq.km with an average population of 185 persons/ hectare. The average rate of sewage flow is 350 litres/capita/day. The maximum flow is 50% in excess of the average together with the rainfall equivalent of 12mm in 24 hours, all of which are run off. What should be the capacity of the sewer in cu.m/sec?	CO-2	**2 marks**
Q2	(a) Estimate the average and maximum hourly flow of sewage for a community of 1000 persons. Assume average water consumption as 200 lpcd, and 80 % of the water consumption goes to sewer. (b) In a water treatment plant, the pH values of incoming and outgoing waters are 8.9 and 9.5 respectively. Assume a linear variation with time; determine the average pH value of water.	CO-2 CO-2	**2 Marks** **2 Marks**
Q3	State and describe four important tests that may be carried out to know the characteristics of sewage?	CO-3	**3 Marks**
Q4	A town has an average domestic sewage flow of 31,710 m^3/day with a BOD concentration of 250 ppm. A neighboring industrial estate adds about 11,325 m/day of sewage having 9080 kg of BOD to it. Compute the concentration of BOD in industrial and the combined sewage, the probable population and per capita flow of sewage and the population equivalents based on the BOD load and hydraulic load.	C0- 4	**5 Marks**
Q5	(a) The 3 days 15°C BOD of a sample of sewage is 250 mg/l. Draw a graph of 5 day BOD as a function of temperature in the range 10°C to 30°C in steps of 5°C. (b) The average sewage flow from a city is 65×10^6 l/d. if the average 5 day BOD is 725 ppm, compute the total daily 5 day oxygen demand in kg, and the population equivalent of sewage. Assume per capita BOD of sewage per day as 115 g	CO-3 CO-2&3	**3 Marks** **3 Marks**
Q6	Give in a tabular form, the average composition of sewage. What is the principle and purpose involved in its treatment and disposal?	CO-4	**2 Marks**

Q7	(a) Given a waste water containing benzene 750 mg/l, calculate the COD. Also assume the value of k s 0.1 per day, compute ultimate BOD and 5 day BOD of the waste?	CO-4	**1.5 Marks**
	(b) The BOD_5 of waste water is 150 mg/l at 20°C. The k value is known as 0.23 per day. What would be BOD_8, if the test was run at 15°C?	CO-3	**1.5 Marks**