PVP 20

Code: 20CE4601D

III B.Tech - II Semester – Regular / Supplementary Examinations
APRIL 2024

SANITARY ENGINEERING
(CIVIL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Explain the rational method of determining the quantity of storm water. Discuss the methods of determining various parameters used in the rational formula.	L3	CO1	7 M
	b)	A 400 mm diameter sewer is running at 40% of full depth on a grade ensuring a degree of self-cleansing equivalent to that obtained at full depth at a velocity of 0.95 m/sec. Given data: Manning's rugosity coefficient = 0.014 and variation of n with depth may be neglected. Determine the required slope along with the associated velocity and rate of discharge at this depth.	L4	CO1	7 M
OR					

2	a)	Give the expression for the discharge in a circular sewer running with a partial flow of sewage in terms of central angle and discharge during full flow.	L4	CO1	7 M
	b)	Describe the sewer appurtenances in detail.	L3	CO1	7 M
		UNIT-II			
3	a)	A 100 mL of domestic wastewater (20°C) having DO of 6.9 mg/L is diluted by adding 700 mL of freshwater (20°C). The final DO after 5 days is found to be 5.4 mg/L. Assume K_D at 15°C as 0.079/day. Calculate BOD_5 and Ultimate BOD at 20°C.	L3	CO2	7 M
	b)	Derive the BOD rate equation.	L3	CO2	7 M
		OR			
4	a)	Write a short note on carbon & sulphur cycles of decomposition.	L3	CO2	7 M
	b)	Explain various physio-chemical characteristics of sewage and their environmental significance.	L3	CO2	7 M
		UNIT-III			
5	a)	Discuss the design criteria for grit chamber.	L3	CO3	7 M
	b)	Differentiate between standard rate and high rate trickling filters.	L3	CO3	7 M
		OR			
6	a)	Explain the working of conventional activated sludge process (ASP) with flow diagram.	L3	CO3	7 M

	b)	Write a short note on (i) Sludge bulking and (ii) sludge volume index.	L3	CO3	7 M
		UNIT-IV			
7	a)	Explain the term "sewage sickness" and also explain the remedies that to be required for the reduction of sewage sickness.	L3	CO4	7 M
	b)	Design a septic tank for a population of 200 in a housing colony with daily sewage flow of 135 litres per capita per day. Assume the data if any required.	L4	CO4	7 M
		OR			
8	a)	Discuss briefly about the disposal of sewage in river water.	L3	CO4	7 M
	b)	Write a short note on oxygen sag curve.	L3	CO4	7 M
		UNIT-V			
9	a)	Explain in detail about sludge conditioning and dewatering with a neat sketch.	L3	CO5	7 M
	b)	Explain in detail about different types of plumbing systems.	L3	CO5	7 M
		OR			
10	a)	Explain clearly different methods of sludge disposal.	L3	CO5	7 M
	b)	List out various sanitary fitting and explain their functions in detail.	L3	CO5	7 M