18CV55

Model Question Paper -1 with effect from 2020-21(CBCS Scheme)

USN

Fifth Semester B.E. Degree Examination

Municipal Wastewater Engineering

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

		Module – 1			
Q.1	(a)	Explain the factors affecting dry weather flow and the effects of flow variations on the design of sewerage system.	10		
Q .1	(b)	Explain the need for sanitation along with different sewerage systems.			
		OR			
Q.2	(a)	Define sewer appurtenances. With neat sketch explain the construction and working of manhole and catch basin.	10		
	(b)	Explain the process of laying and testing of sewers	10		
		Module – 2			
Q.3	(a)	Design a sewer to serve a population of 36,000, the daily per capita water supply allowance being 135 litres, of which 80%, find its way into the sewer. The slope available for the sewer to be laid is 1 in 625 and the sewer should be designed to carry four times the dry weather flow, when running full. What would be the velocity of flow in the sewer when running full?			
	(b)	Explain the factors to be considered while selecting the sewer material. What are the commonly used sewer materials?	10		
		OR			
	(a)	Draw a neat flow diagram employed in Municipal wastewater treatment plant.	06		
Q.4	(b)	The 5 day BOD at 30° C of a sewage sample is 120mg/L. Calculate 5 days BOD at 20°C. Assume deoxygenation constant at 20°C, $K = 0.1/day$.			
	(c)	Explain: a) Self cleansing velocity and b) Non scouring velocity.	08		
		Module – 3			
Q.5	(a)	Explain the importance of screens and types of screens in the sewage treatment process.	10		
	(b)	Write short notes on:a) Sewage sickness andb) Sewage farming	10		

18CV55

		OR	
	(a)	Discuss in detail the process of Deoxygenation and Reoxygenation with respect to self- purification of Natural water with a neat sketch. A stream, saturated with D O, has a flow of 1.2 m ³ /sec, BOD of 4 mg/L and rate	10
Q.6	10		
		days. Take saturation D O at 20°C as 9.17 mg/L Module – 4	
	(a)	Explain the working of conventional activated sludge process (ASP) with flow diagram	10
Q.7	(a) (b)	Design a primary sedimentation tank of circular cross-section, for a sewage of 10 MLD, detention period of 2 hours and assume the surface loading rate to be $30 \text{ m}^3/\text{m}^2/\text{d}$.	10
		OR	
	(a)	Explain briefly the different stages of sludge digestion process in a "Digestor". With a neat sketch, explain the constructional details of sludge digestion tank.	10
Q.8	(b)	Determine the size of the High rate trickling filters for the following data: i) sewage flow = 4.5 MLD ii) Recirculation ratio = 1.5 iii) BOD of Raw sewage = 250 mg/L iv) BOD removal in primary tank = 30% v) Final effluent BOD desired = 30 mg/L	10
		Module – 5	
	(a)	What do you understand by advanced wastewater treatment? How is it different from the conventional treatment? Give, in a tabular form, important AWT processes.	10
Q.9	(b)	Draw a neat sketch of septic tank with soak pit, Write the design criteria required for septic tank.	10
	1	OR	
	(a)	Discuss in brief the biological and chemical methods of removal of phosphorous from wastewater.	10
Q.10	(b)	Write a short note on: a) eco toilet. b) two pit latrines.	10

Ta	ble sl	howing the Bloom's Tax		Level, Course Outc come	ome and Programme	
Question		Bloom's Taxonomy L attached	level	Course Outcome	Programme Outcome	
Q.1	(a)	L1		i	1, 2, 3, 6 and 7	
	(b)	L1		i	1,2,3 and 6	
Q.2	(a)	L1		i	1,2,3 and 6	
	(b)	L2		i	1,2,3 and 6	
Q.3	(a)	L3		ii	1,2,3 and 6	
	(b)	L2		ii	1,2,3 and 6	
Q.4	(a)	L1		ii	1,2,3 and 6	
	(b)	L3		ii	1,2,3 and 6	
	(c)	L2		ii	1,2,3 and 6	
Q.5	(a)	L2		iii	1,2,3 and 6	
	(b)	L1		ii	1,2,3 and 6	
Q.6	(a)	L2		iii	1,2,3 and 6	
	(b)	L3		iii	1,2,3 and 6	
Q.7	(a)	L2		ii	1,2,3 and 6	
	(b)	L3		ii	1,2,3 and 6	
Q.8	(a)	L2		ii	1,2,3 and 6	
	(b)	L3		ii	1,2,3 and 6	
Q.9	(a)	L1		v	1,2,3 and 6	
-	(b)	L2		v	1,2,3 and 6	
Q.10	(a)	L1		v	1,2,3 and 6	
	(b)	L1		v	1,2,3 and 6	
			Lower	order thinking skills	<u> </u>	
Bloom's Taxonomy Levels		Remembering Understanding			Applying (Application):	
		$(\text{knowledge}):L_1$ (Compred		ehension): L_2	L_3	
		Higher order thinking skills				
		Analyzing (Analysis): L ₄	Valuatii	ng (Evaluation): L_5	Creating (Synthesis): L_6	

