VIT
Vellore Institute of Technology

Final Assessment Test – November 2019

Course: CLE2019 - Pollution Control and Monitoring
Class NBR(s): 3805 / 6600
Time: Three Hours

Slot: B1
Max. Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS EXAM MALPRACTICE

Answer any TEN Questions
(10 X 10 = 100 Marks)

1. Differentiate between the following with examples
   a) Act and Rule
   b) Protectionist Policy and Improvinistic Policy

2. A city discharges 25 MLD domestic sewage into a stream whose average flow is 185 MLD. The average depth and velocity of the stream is 2.4 m and 2 km/hr. The temperature of both the stream and sewage is 20°C. The 20°C BOD_5 of the sewage is 80 mg/L, while that of the stream is 1.2 mg/L. The sewage contains no DO, and the stream is 90% saturated upstream of the discharge. At 20°C, k_1, saturated oxygen concentration are 0.34 per day, and 9.1 mg/L respectively.
   - Find the time and distance downstream at which the oxygen deficit is a maximum.
   - Find the minimum value of DO.

3. Discuss the Fractional Collection Efficiency of Electrostatic Precipitator with respect to the collection area and draft velocity. What are the significance of discharge electrode and collecting electrode for the removal of particles?

4. You have found that the wastewater from your residential complex is having excess amount of Phosphate and TKN which is directly discharged to nearby lake. In your opinion what might be the possible consequences for this? What you can do to remove these constituents from the wastewater?

5. Explain in detail about the various methods for safe disposal of solid and liquid wastes of a village.

6. Enumerate the effects of the air pollution on human health and vegetation.

7. Discuss in detail about any two low cost sanitation methods along with their merits and demerits.

8. The area available for the landfill is 8 ha and the maximum height of the landfill might be 10 m. What would be the proposed life span of the landfill on the basis of the following information for a present population of 10000 with 7% annual increase? Assume any missing data.

9. Explain different pathways for the thermochemical processing of solid waste.

10. Write a short note on (i) Indicators of sustainable development and (ii) Industrialization and sustainable development.

11. Explain the working principle of Falling Film Evaporator with neat sketch.

12. a) If an industrial sound source has a pressure of 3000 µPa at 10 m distance, compute: [5]
       i. the sound pressure level in dB,
       ii. the sound intensity in W/m^2 and
       iii. the sound power in W.
    b) Calculate the average sound pressure level of the sound by assuming the following data mentioned in the table 1. [5]

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Octave Band (Hz)	SPL (dB)	$10^{(SPL_i/10)}$
31.5	10	10
63	12	15.8
125	16	39.8
250	15	31.6
500	22	158.5
1000	52	158,489
2000	32	1585
4000	40	10,000
8000	28	631.0
16,000	27	501.2
32,000	34	2512

13. Determine the chemical equation (without moisture) and energy available dry basis for 100 kg of dry mass of the following composition of solid waste.

Component	Dry Mass (kg)	% of mass (dry basis)				
		C	H	O	N	S
Food waste	25	48	6.4	37.6	2.6	0.4
Paper	20	43.5	6	44	0.3	0.2
Cardboard	8	44	5.9	44.6	0.3	0.2
Plastics	15	60	7.2	22.8	----	----
Wood	8	49.5	6	42.7	0.2	0.1

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