Hall Ticket Number:

CE314(CEEL02) (R20)

B.TECH. DEGREE EXAMINATION, NOVEMBER-2024

Semester V [Third Year] (Regular & Supplementary)

ADVANCED ENVIRONMENTAL ENGINEERING

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) What are the main changes that occur in the receiving stream when organic waste is discharged into it? CO1
   (b) Determine self-purification constant, if deoxygenation coefficient is 0.2/day & reaeration coefficient is 0.6/day. CO1
   (c) Name any two chemicals used for the removal of phosphates from waste water. CO1
   (d) Distinguish between adiabatic lapse rate & inversion. CO2
   (e) Define mixing height. CO2
   (f) Name the gases responsible for global warming. CO2
   (g) What are the two disadvantages of gravity settling chambers? CO3
   (h) What is a scrubber? CO3
   (i) What are the permissible noise levels for residential area? CO3
   (j) Which pollutants are released from the automobile exhaust? CO3
   (k) What is a leachate? CO4
   (l) What is a hazardous waste? CO4
   (m) What do you understand by pyrolysis? CO4
   (n) List any two examples for reuse of solid waste. CO4

UNIT – I

2. (a) Explain the factors influencing the self-purification of streams. (7M) CO1

(b) A municipal wastewater treatment plant effluent having a maximum flow rate of 13,500 m^3/d, BOD_5 of 100 mg/l, DO concentration of 1 mg/l and temperature 25^0C. The stream (u/s from the point of waste water discharge) is found to have a minimum flow rate of 0.6 m^3/s, BOD_5 of 3 mg/l, DO concentration of 8.0 mg/l & temperature of 20^0C. Complete mixing of the waste water & stream is almost instantaneous, and the velocity of mixture is 0.2 m/s. The de-oxygenation constant and re-aeration constant are estimated to be 0.23/d and 0.46/d respectively, at 20^0C. Determine the critical deficit and its location from the point of wastewater discharge. Saturation DO at 20^0C may be taken as 9.17 mg/l. (7M) CO1

(OR)

3. (a) Explain biological nitrification and de-nitrification method of removal of nitrogen from waste water. (7M) CO1
   (b) With a neat diagram explain the working of rotating disc biological contactor. (7M) CO1

UNIT – II

4. (a) Explain classification and types of air pollutants with examples. (7M) CO2
   (b) Discuss the effects of air pollution on human health. (7M) CO2

(OR)

5. (a) Explain the causes and control measures of acid rains and ozone layer depletion. (8M) CO2
   (b) Explain plume behaviour under different environmental conditions. (6M) CO2

UNIT – III

6. (a) Explain a dry cyclone with neat diagram. What are the dimensions of a standard cyclone, if the diameter of the cylindrical portion is 'd'. (7M) CO3
   (b) Determine the number of tubular ESPs required for removing 0.5 μm sized fly ash from a cement industry with a gas flow rate of 12 m^3/sec for obtaining (i) 90 % efficiency & (ii) 99 % efficiency. Pilot plant studies showed that the drift velocity $w = 2.0 \times 10^5$ d m/sec. The diameter of the tubes may be assumed as 0.3 m and length as 5 m each. (7M) CO3

(OR)

7. (a) Explain the causes and control measures of noise pollution. (7M) CO3
   (b) Explain the sources of automobile pollution. (7M) CO3

UNIT – IV

8. (a) Explain classification and sources of solid waste. (6M) CO4
   (b) Summarise Indore and Bangalore methods of composting. (8M) CO4

(OR)

9. Explain various methods adopted for the treatment of hazardous wastes. CO4

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Hall Ticket Number:

CE314(CEEL02) (R20)

B.TECH. DEGREE EXAMINATION, APRIL-2024

Semester V [Third Year] (Supplementary)

ADVANCED ENVIRONMENTAL ENGINEERING

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

(a)	Define dissolved oxygen.		CO1
(b)	If waste water is to be discharged into an inland stream, what are the permissible limits for BOD5 and suspended solids?		CO1
(c)	Define activated sludge.		CO1
(d)	Define denitrification.		CO2
(e)	Define aerosol.		CO2
(f)	What is temperature inversion?		CO2
(g)	Mention any two causes of acid rains.		CO3
(h)	List global effects of air pollution.		CO3
(i)	Mention the purpose of settling chamber.		CO3
(j)	Write the limits for noise levels in commercial zone.		CO4
(k)	Define pyrolysis.		CO4
(l)	List sources of urban solid waste management.		CO4
(m)	Define hazardous waste.		CO4
(n)	List some disposal methods of hazardous waste management.		CO4

UNIT – I

2.	(a)	Explain various zones of self-purification.	(7M)	CO1
	(b)	Describe impact of pollutants on stream waters and usage of stream water with special reference to flora and fauna.	(7M)	CO1

(OR)

3.	(a)	Describe nitrogen removal by biological denitrification process.	(7M)	CO1
	(b)	Sketch and explain U tube aeration systems.	(7M)	CO1

UNIT – II

4.	(a)	Explain natural and manmade sources of air pollution.	(7M)	CO2
	(b)	Describe plume behaviours in case of air pollution.	(7M)	CO2

(OR)

5.	(a)	Explain aerosols and gaseous pollutants in case of air pollution.	(7M)	CO2
	(b)	Explain effects of air pollutants on human health and on plants.	(7M)	CO2

UNIT – III

6.	(a)	Explain inertial separators and electrostatic precipitators with a neat sketch.	(7M)	CO3
	(b)	Explain sources of noise and their noise levels.	(7M)	CO3

(OR)

7.	(a)	Discuss briefly how you control automobile emissions.	(7M)	CO3
	(b)	Explain various factors affection control of noise pollution.	(7M)	CO3

UNIT – IV

8.	(a)	Explain classification, collection and transportation of urban solid waste management.	(7M)	CO4
	(b)	Classify hazardous waste management.	(7M)	CO4

(OR)

9.	(a)	Explain various treatment methods of disposal of urban solid waste management.	(7M)	CO4
	(b)	Explain biological and thermal treatment of hazardous waste management.	(7M)	CO4

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Hall Ticket Number:

CE314(CEEL02) (R20)

B.TECH. DEGREE EXAMINATION, DECEMBER-2023

Semester V [Third Year] (Regular & Supplementary)

ADVANCED ENVIRONMENTAL ENGINEERING

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

(a)	Define self-purification.	CO1
(b)	Differentiate flora and fauna.	CO1
(c)	Define activated sludge.	CO1
(d)	Mention the purpose of sequencing batch reactor.	CO2
(e)	List natural sources of air pollution.	CO2
(f)	What is temperature inversion?	CO2
(g)	Mention any two causes of acid rains.	CO3
(h)	State the purpose of scrubbers.	CO3
(i)	What are the pollutants that are released from the exhaust of a petrol vehicle?	CO3
(j)	Write the limits for noise levels in commercial zone.	CO4
(k)	Define incineration.	CO4
(l)	List sources of urban solid waste management.	CO4
(m)	Define hazardous waste.	CO4
(n)	Differentiate solidification and stabilization.	CO4

UNIT – I

2. (a)	Explain various factors affecting self-purification.	(7M)	CO1
(b)	Describe Streeter-Phelps's dissolved oxygen model.	(7M)	CO1

(OR)

3. (a) Describe nitrogen removal by biological nitrification process. (7M) CO1
   (b) Sketch and explain up flow anaerobic sludge blanket reactor. (7M) CO1

UNIT – II

4. (a) Explain various sources and classification of air pollution. (7M) CO2
   (b) Describe Gaussian dispersion model. (7M) CO2

(OR)

5. (a) Explain primary and secondary pollutants in case of air pollution. (7M) CO2
   (b) Explain Ozone depletion. (7M) CO2

UNIT – III

6. (a) Explain various types of collection equipment in air pollution. (7M) CO3
   (b) Explain various levels of noise and measurement of noise pollution. (7M) CO3

(OR)

7. (a) Discuss briefly how you control automobile emissions. (7M) CO3
   (b) What are the common sources of noise pollution? Explain. (7M) CO3

UNIT – IV

8. (a) Explain various quantities and characteristics of urban solid waste management. (7M) CO4
   (b) Classify hazardous waste management. (7M) CO4

(OR)

9. (a) Explain various treatment methods of disposal of urban solid waste management. (7M) CO4
   (b) Explain physical and chemical treatment of hazardous waste management. (7M) CO4

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