



M.E DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2014)

Second Semester

ENERGY ENGINEERING

P14EET202: Environmental Engineering and Pollution Control

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match list I (Wastes) with list II (Average Degradation time) and select the correct answer [K₂]
using the codes given below

List I	List II
A. Cardboard box	i. 6 months
B. Milk or juice carton	ii. 3 months
C. Paper tissues and napkins	iii. 12 months
D. Matches	iv. 2 months

A B C D

- a) ii i iv iii
b) iv i ii iii
c) iv iii ii i
d) iii i iv ii

2. Which of the following is not an inorganic pollutant in water? [K₁]
a) Mineral acids b) Finely divided metals
c) Elastomers d) Cyanides
3. _____ is the most popular coagulant used in both water and waste water treatment [K₂]
a) Hydrated lime b) Alum
c) Chlorinated copper d) Ferric chloride
4. The term _____ is used to describe the black smoke which consists of carbonaceous products of incomplete combustion, chars, charcoals, and soots. [K₁]

- a) Aerosol
- b) Ozone
- c) Black carbon
- d) Sulfate

5. Consider the following statements. [K₂]

- 1. The presence of multivalent cations in solution is referred to as water hardness.
- 2. The principal ions causing hardness in natural water are calcium and magnesium.
- 3. Alkalinity of water refers to the water capability to absorb metal anions with change in pH value.
- 4. The hardness of water is calculated using the concept of convention of mass.

Which of these statements are correct?

- a) 1,3
- b) 1,4
- c) 2,3
- d) 1,2

6. Activated sludge process of sewage treatment is a _____ treatment process. [K₁]

- a) Preliminary
- b) Primary
- c) Biological
- d) Secondary

7. _____ is low in suspended solids (TSS). [K₂]

- a) Ground water
- b) Sea water
- c) Surface water
- d) Reclaimed water

8. Assertion (A): Hazardous wastes are those defined as wastes of industrial, institutional or consumer origin that are potentially dangerous either immediately or over a period of time to human beings and the environment. [K₄]

Reason (R): Environmental hazardness of waste is due to their physical, chemical and biological or radioactive characteristics like ignitability, corrosivity, reactivity and toxicity

- a) Both A and R are individually true and R is the correct explanation of A
- b) Both A and R are individually true but R is not the correct explanation of A
- c) A is true but R is false
- d) A is false but R is true.

9. Which noise can be tolerated by human ear? [K₁]

- a) >100 decibels
- b) <20 decibels
- c) >120 decibels
- d) <80 decibels

10. Consider the following unit operations for ground water treatment plant. [K₂]

- 1. Coagulation
- 2. Sedimentation
- 3. Filtration

4. Aeration

5. Recarbonation

The correct sequence of the above unit operation is

- a. 5-2-3-4-1
- b. 1-3-2-4-5
- c. 3-4-2-1-5
- d. 4-1-2-5-3

- a) a
- b) b
- c) c
- d) d

PART B (10 x 2 = 20 Marks)

- 11. Distinguish between BOD and COD. [K₂]
- 12. List the sources of water pollution. [K₁]
- 13. Write down the reaction that causes the ozone layer depletion. [K₂]
- 14. State the effects of air pollutants on man and his environment. [K₁]
- 15. Based on the source and type, classify the waste generated in your locality. [K₃]
- 16. Name some of the alternative fuels used to reduce air pollution. [K₁]
- 17. State the effect of “turbulence” in atmospheric dispersion and mention the mechanism. [K₂]
- 18. Mention the control measures of noise pollution. [K₁]
- 19. State the objectives of recycling. [K₂]
- 20. Distinguish between coagulation and sedimentation. [K₂]

PART C (10 x 5 = 50 Marks)

- 21. Demonstrate the material balance equation with suitable examples and state the simplifications on basic equation. [K₃]
- 22. Categorize the sources of carbon dioxide emissions that cause Green House effect. [K₂]
- 23. Describe the sources and effects of photo chemical oxidants. [K₂]
- 24. Explain IAQ and state the effects of the contaminants. [K₃]
- 25. Demonstrate the sludge treatment and nitrogen removal process. [K₃]
- 26. State and explain the standard processes for managing municipal waste. [K₃]
- 27. Evaluate the important parameters for the design of Electro Static Precipitators. (ESP). [K₅]
- 28. Summarize the effects of pesticide movement into Surface and Ground Water. [K₃]
- 29. Enumerate the factors that can contribute to waste minimization. [K₃]
- 30. Mention the adverse impacts associated with a highway, hydro-electric and thermal power projects. [K₄]

PART D (2 x 10 = 20 Marks)

31. Propose a case study of water pollution from tanneries in Tamilnadu and prepare the possible solutions to control the pollution. [K₆]
32. Devise the three types of waste-to-energy incineration techniques with neat sketches. [K₆]
