

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), November 2016

B. Tech in Mechanical Engineering, Semester VII

Roll No.....

ME 725: Industrial Pollution Control

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
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Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

10

- i. Which material accounts for the greatest percentage of the weight of solid waste?
 - A. food waste
 - B. plastic
 - C. paper
 - D. yard waste
- ii. Essentially five techniques - incineration, landfills, source reduction, composting, and recycling-are used to dispose of solid waste.
 - A. True
 - B. False
- iii. Typical modern municipal landfills contain which of the following?
 - A. monitoring wells
 - B. impermeable barriers
 - C. methane retrieval systems
 - D. all of the above
- iv. Which is not true about incineration of solid waste?
 - A. there are drastic reductions in the volume and weight of wastes
 - B. the ash can contain heavy metals and other toxic substances
 - C. the incinerators can be built to generate electricity
 - D. all of the above are true
- v. Deep-well injection is most likely to pollute _____ if the hazardous waste escapes from storage.
 - A. food
 - B. groundwater
 - C. oceans
 - D. the air
- vi. Most of the pollution in the ocean comes from:
 - A. commercial boats
 - B. waste from land
 - C. oil spills
 - D. leaking tankers

- vii. The process of nutrient enrichment is termed as
 - A. Eutrophication
 - B. Limiting nutrients
 - C. Enrichment
 - D. Bio-magnification
- viii. The major source of carbon mono oxide is:
 - A. motor vehicle
 - B. industrial processes
 - C. stationery fuel combustion
 - D. volcanoes
- ix. The principle source of volatile organics is:
 - A. motor vehicle
 - B. industrial processes
 - C. stationery fuel combustion
 - D. volcanoes
- x. Air pollution is severe in:
 - A. cities
 - B. densely populate areas
 - C. industrial areas
 - D. all of these

- Q.2 Short answer type questions (4 questions @ 2.5 marks) 10
- i. Which are the gases mostly present in air as pollutant gases?
 - ii. What are the health effects of particulate matter in the air?
 - iii. Explain the term 'biomagnification' as a result of water pollution.
 - iv. Explain difference between COD and BOD of a water sample.
- Q.3A Explain the causes and effects of eutrophication of a water body. 05
- Q.3B What are the different sources of ocean water pollution? 05
- Q.4A Explain the difference between point source and non-point source water pollution with the help of suitable examples. 05
- Q.4B Explain various sources of pollution of ground water. 05
- OR
- Q.4B Explain various sources of pollution of surface water. 05
- Q.5A Describe different types of membrane filtration systems according to their pore size and applications. 05
- Q.5B Why environmental considerations are necessary for the sustainability of manufacturing industries? 05
- Q.6A What is photochemical smog? How it is formed; explain with the help of chemical reactions. 05
- Q.6B The mean concentration of Sulphur dioxide in Mumbai is $47 \mu\text{g}/\text{m}^3$. What is the equivalent concentration in parts per million at 25°C and 1 atmosphere pressure? 05

OR

- 6B What is bio-diversity? Explain the importance of biodiversity. 05
- Q.7A For a high volume filtration set up test run for 24 hours, the following data are given: 05
- Air flow through clean filter = $1.7 \text{ m}^3/\text{min}$
Air flow through the filter at the end of the test = $1.4 \text{ m}^3/\text{min}$
Average air flow = $1.55 \text{ m}^3/\text{min}$
Weight of the clean filter = 5 g
Weight of the filter after the exposure = 5.348 gm
Calculate the suspended particulate concentration in the air.
- Q.7B What is desulphurization of the flue gas and how is it carried out? Explain with the help of necessary chemical reactions. 05
- OR
- Q.7B What are different methods of particulate sampling? Explain with the help of appropriate diagrams. 05
- Q.8A Explain the application and the working principle of the flame ionization detector. 10
- Q.9A Describe the principle of carbon monoxide measurement with the help of non-dispersive infrared analyzer with the help of appropriate diagram and chemical reactions. 10
- Q.9B What is the biomedical waste? What are different ways to safely dispose different types of biomedical wastes? 10
- OR
- Q.9B What are different sources of nuclear waste? Mention different ways to manage and dispose the nuclear waste. 10