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Total No. of Questions: [09]

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**B. Tech. Civil Engg. (Semester – 7<sup>th</sup>)**  
**AIR & NOISE POLLUTION AND CONTROL**  
**Subject Code: BCIED1712**  
**Paper ID: [18110756]**

**Time: 03 Hours**

**Maximum Marks: 60**

**Instruction for candidates:**

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

**Section – A**

**(2 marks each)**

Q1. Attempt the following:

- a. What are the main constituents of air pollution, and how do they affect the environment?
- b. Explain the term "stack height" and its significance in air pollution dispersion.
- c. Name two control devices used for particulate air pollutants and briefly describe how they work.
- d. Describe one method each for controlling sulphur oxides, nitrogen oxides, carbon monoxide, and hydrocarbons.
- e. What are the primary differences between Euro-I, Euro-II, and Euro-III emission specifications for automobiles?
- f. Define sound intensity and sound pressure levels in the context of noise pollution.
- g. How does psycho-acoustics contribute to our understanding of noise pollution effects on human health?
- h. Mention two special noise environments and briefly explain their characteristics.
- i. What are noise indices, and how are they used in monitoring noise pollution?
- j. Briefly explain the concept of annoyance rating schemes in assessing noise pollution impacts.

**Section – B**

**(5 marks each)**

- Q2. Explain the global implications of air pollution by addressing the following points: the composition and structure of the atmosphere, the classification of major air pollutants (Particulates, hydrocarbons, Carbon monoxide, Oxides of sulphur, Oxides of nitrogen, and photochemical oxidants), and the impacts of these pollutants on humans, animals, property, and plants, including both outdoor and indoor air pollution effects.
- Q3. Discuss the relationship between meteorological factors and air pollution dispersion, incorporating concepts such as temperature lapse rate, atmospheric stability, wind velocity, and turbulence.
- Q4. Explain how these factors (given in Question no. 3) influence plume behavior and the dispersion of air pollutants, with specific reference to the Gaussian Plume Model.

Additionally, analyze the significance of stack height in relation to dispersion and the overall impact on air quality management.

- Q5. Discuss specific methods for controlling sulphur oxides, nitrogen oxides, carbon monoxide, and hydrocarbons, highlighting the advantages and limitations of each approach. Evaluate the role of automotive emission control technologies, including catalytic converters, in reducing gaseous pollutants from vehicles.
- Q6. Describe the characteristics of different types of sound sources, such as plane, point, and line sources, as well as the effects of multiple sources on noise propagation. Discuss the differences between outdoor and indoor noise propagation and their respective impacts on human health and well-being.

**Section – C**

**(10 marks each)**

- Q7. Explain the principles behind stack sampling and its relevance in assessing emissions from industrial sources. Evaluate the effectiveness of control devices for particulate contaminants, such as gravitational settling chambers, cyclone separators, wet collectors, fabric filters (Bag-house filter), and electrostatic precipitators (ESP), in reducing air pollution.
- Q8. Examine special noise environments, such as infra-sound, ultrasound, impulsive sound, and sonic boom, discussing their unique characteristics and potential impacts. Compare noise standards and limit values set by regulatory bodies and their significance in noise pollution management.
- Q9. Examine indoor air pollution sources and their adverse effects on human health, animals, property, and plants. Provide specific examples of indoor air pollutants and their impacts, discussing strategies for mitigating indoor air pollution.