

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**MSc DEGREE EXAMINATION MAY 2023
(First Semester)**

**Branch – ENVIRONMENTAL SCIENCE
AIR POLLUTION AND MANAGEMENT**

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. In troposphere, temperature _____ with height.
i) increases ii) decreases
iii) constant iv) none of the above
2. Which of the following is not a green house gas?
i) SO₂ ii) CO₂ iii) H₂O iv) CFC
3. PM₁₀ refers to the particulates that are
i) 10 µg in weight or above ii) 10 µg in weight or less
iii) 10 µm in size or above iv) 10 µm in size or less
4. In Stoke's equation, ρ_p stands for _____ of the particle.
i) diameter ii) mass iii) density iv) settling velocity
5. Exhaust Gas Recirculation is a method of controlling _____ from vehicles.
i) CO ii) CO₂ iii) NO_x iv) SO₂

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a) Briefly explain the formation of geostrophic wind.
OR
b) Differentiate between ELR and DALR.
7. a) State the effects of acid rain on forests.
OR
b) Explain the importance of oxygen-ozone cycle in maintaining ozone levels in the upper atmosphere.
8. a) Recommend the number of air quality monitoring stations for a city having a population of 7 lakhs for PM₁₀, SO₂ and NO_x as per IS:5182 (Part 14), 2000.
OR
b) Justify the use of decibel scale in noise measurements.
9. a) Classify the types of biofuels.
OR
b) Summarize the advantages of an ESP in control of particulates.
10. a) List out the assumptions made in Gaussian Dispersion modeling.
OR
b) Justify the use of alternative fuels in vehicles. Give two examples of alternative fuels.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks $(5 \times 6 = 30)$

11. a) Explain plume behavior under unstable and stable conditions with diagrams.
OR
b) Explain the determination of mixing height of the atmosphere.
12. a) Discuss the effects of PM_{10} on human health.
OR
b) Explain the relationship between green house effect and global warming.
13. a) Discuss the salient features of National Ambient Air Quality Standards 2009.
OR
b) Explain the methods of sampling and measurement of PM_{10} concentration by gravimetry in the ambient atmosphere.
14. a) Design a bag house using filter bags with 0.25 m in diameter with 7.0 m length. The flow rate of the particulate laden gas is $10 \text{ m}^3/\text{s}$; the filtering velocity of fabric has been determined to be 2.2 m / min. Determine the number of bags required for continuously cleaning operation.
OR
b) Design with a neat diagram, a cyclone separator for particulate control with standard dimensions.
15. a) Discuss the advantages of Bharat VI emission standards.
OR
b) Categorize the types of hybrid vehicles and explain their advantages.

Z-Z-Z

END