22ESP102N/ 22ESP102

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023
(First Semester)

Branch - **ENVIRONMENTAL SCIENCE**

AIR POLLUTION AND MANAGEMENT

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Earth's atmosphere is composed of 78% ____ and 21% _____. a) Hydrogen and Oxygen b) Hydrogen and Ozone c) Nitrogen and Oxygen d) Nitrogen and Ozone	K1	CO1
	2	Plume behavior during inversion is a) Looping Plume b) Coning Plume c) Fumigation d) Fanning Plume	K2	CO1
2	3	Ozone in the troposphere is a a) primary pollutant b) secondary pollutant c) major constituent d) non-pollutant	K1	CO2
	4	Which one of the following is a secondary pollutant? a) carbon monoxide b) Nitrogen dioxide c) Sulfur dioxide d) Hydrogen sulfide	K2	CO2
3	5	$PM_{2.5}$ refers to a) Particulates with size below or equal to 2.5 μm b) Particulates with size below or equal to 2.5 mm c) Particulates with size below or equal to 2.5 nm d) Particulates with size below or equal to 2.5 cm	K1	CO2
	6	According to Air Quality Standards in respect to Noise in India, night time is a) From 6 p.m. to 6 a.m. b) From 7 p.m. to 6 a.m. c) From 10 p.m. to 6 a.m. d) From 10 p.m. to 5 a.m.	K2	CO3
4	7	The overall efficiency of gravitational settling chamber in collecting particulates is a) 80% b) 70% c) 60% d) 50%	K1	CO4
	8	The velocity at which the particles move towards the collection plate in an ESP is known as a) Settling velocity b) Terminal velocity c) Drift velocity d) Coulomb velocity	K2	CO4
5	9	In Gaussian Dispersion Model, σ_y, σ_z are a) Wind speed coefficients b) Diffusion coefficients c) Temperature coefficients d) Pressure coefficients	K1	CO5
	10	Effective Stack Height is = a) $h + \Delta h$ b) $h - \Delta h$ c) $h + 2\Delta h$ d) $h - 2\,\Delta h$	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the forces for the formation of wind with neat sketch.	K3	CO1
		(OR)		
	11.b.	Compare and explain the Environmental Lapse Rate and Adiabatic Lapse Rate.		
2	12.a.	Distinguish between primary and secondary air pollutants with examples.	K3	CO2
		(OR)		
	12.b.	Contrast green house effect and enhanced green house effect.		
3	13.a.	Explain the steps followed in developing air quality standards.	K4	CO2 & CO3
		(OR)		
	13.b.	Relate the decibel with actual sound pressure level in noise measurements.		
4	14.a.	Explain the advantages and disadvantages of combustion techniques for control of gaseous contaminants.	K4	CO4
		(OR)		
	14.b.	Distinguish between adsorption and absorption techniques in control of gaseous contaminants.		
5	15.a.	Examine the key features of a hybrid vehicle.	K5	CO5
		(OR)		
	15.b.	Discuss the beneficial aspects of e-vehicles.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Compare the plume behavior under unstable, neutral and inversion conditions.	K4	CO1
2	17	Explain the mechanism involved in formation of acid rain in the atmosphere.	K4	CO1
3	18	Distinguish the prescribed sampling and analytical procedures for SO_2 in the ambient atmosphere.	K5	CO2
4	19	Compare an ESP and a fabric filter in their working principles and recommend a suitable device for control of particulates in a cement industry.	K5	CO4
5	20	Explain in detail the Gaussian Dispersion model for non-reactive pollutants from a point source.	K4	CO5

Z-Z-Z END