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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Civil Engineering **Duration: 3 hrs.**
Course Code: 20CV5PEAPL **Max Marks: 100**
Course: Air Pollution **Date: 03.03.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1 a) Define air pollution. Explain different sources of air pollution. **06**

b) Why is the ozone layer important? What is ozone depletion, and how does it occur? **08**

c) Explain the effect of air pollutants Fluorine and Arsenic on animals. **06**

UNIT - II

2 a) With a neat sketch, deliberate on the structure and composition of the atmosphere. **08**

b) A sample of air analyzed is reported to contain 0.02 ppm of NO_2 and 0.05 ppm of SO_2. Determine the equivalent NO_2 and SO_2 concentration in microgram per cubic meter of air for the following environmental conditions. **08**

Temperature (K)	Pressure (atm)
298.15	1
273.15	1

c) List the meteorological factors that influence air pollution. **04**

UNIT - III

3 a) A coal-fired 2000 MW power plant is operating around 40% efficiency. The Sulphur content in coal used is 4% and the calorific value of coal is 20 MJ/kg. Find the emission rate of SO_2 from the power plant. **08**

b) With a neat sketch, explain the working principle of the gravity settling chamber and electrostatic precipitator. **12**

UNIT - IV

4 a) Mention the National Ambient Air Quality Standards (annual average and 24 h average) for the following air pollutants in industrial areas and ecologically sensitive areas. **06**

i. SO_2 ii. $PM_{2.5}$ iii. NO_2

	b)	Explain with a neat sketch working principle of high volume air sampler for quantification of particulate matter.	**08**
	c)	Discuss the scales of air pollution problems and explain the levels of air quality management.	**06**

OR

5	a)	Explain with a neat sketch the sampling train for collection of gaseous pollutants.	**10**
	b)	Discuss isokinetic sampling conditions for particulates collection during stack monitoring.	**10**

UNIT - V

6	a)	Explain with a neat sketch the wind driven circulation at mountain and valley region during day time and night time.	**10**
	b)	Derive the continuity equation for the flow of incompressible air through a tube under steady state condition.	**10**

OR

7	a)	Explain with a neat sketch the wind driven circulation at intersection of land and sea during day time and night time.	**10**
	b)	Explain behavior of wind in the context of Coriolis force, pressure gradient and frictional force.	**10**

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