TE1213

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T.E - (Civil) (Sem-VI)(Revised Course 2019-2020)

EXAMINATION JANUARY 2024

OPEN ELECTIVE - Air and Noise Pollution and Control

[Time: 3:00 Hours] [Max. Marks:100]

Instructions: 1) Answer Any Five Questions: At Least Two From Part A. Two From Part - B and One From Part – C

2) Make Suitable Assumptions Whenever Required

3) Illustrate With 'Neat Sketches 'Wherever Necessary

PART-A

Q.1 Answer any two

A.	Write classification of air pollutant and sources of air pollutant	**10**
B.	How does it Ozone layer depletion occur? Explain ways to protect ozone layer	**10**
C.	Define PM, SPM and RSPM. Explain health effects of Dust	**10**

Q.2	**A.**	Define Dispersion. What are the applications of dispersion model?	**7**
	B.	What are the metrological parameters that influence air pollution?	**7**
	C.	Explain high volume sampler particulate matter sampling procedure	**6**

Q.3	**A.**	List out air sampling device. Explain any two air sampler	**10**
	B.	**i.** Define PM. SPM and RSPM.	**3**
		ii. Determine the Concentration of Suspended Particulate Matter with the following data recorded in high volume air sampler (a) Weight of fresh filter paper (grams): -5 (b) Weight of the filter paper after sampling (grams): - 5.348 (c) Initial sampling rate (Cubic meters per minute); - 1.7 (d) Final sampling rate (Cubic meters per minute); - 1.4 (e) (e) Sampling Time (Minutes); -480	**7**

PART-B

Q.4 A. Explain noise pollution effects and control methods 10

B. Explain in detail the outdoor noise propagation and indoor noise propagation in relation with noise pollution and control 10

Q.5 A. Explain the electrostatic precipitator (ESP) in detail. 8

B. Explain any two: - 6+6

a. Permissible limits of noise

b. Sound level meter

c. Fabric filters

Q.6 A. Define any three 3

i. Temperature lapse rates,
ii. Adiabatic lapse rate
iii. Atmospheric stability
iv. Plume
v. Plume Rises

ii. A coal fired power plant releases from the stack SPM at the rate of 2.3g/s. The stack height is 60m while the temperature of the stack gases is 1600°C and the ambient air temperature is 30°C. The wind velocity at the stack height is 2.5m/s, while the stack gas velocity is 5.0m/s. The stack diameter is 3.5m. The atmosphere pressure is 1.005 bar. The wind speed at 10m height from the ground is 1.95 m/s. Estimate the effective height of a stack, 7

B. Explain **any two: -** 5+5

a. Settling chambers

b. Air sampling methods

c. Principles of noise control

PART-C

Q.7 A. Enumerate methods of control of particulate matter. Explain any two in detail Explain Noise monitoring procedure. 8

B. Explain Noise monitoring procedure. 7

C. Define stack height, write formula for calculating effective stack height 5

Q.8	A.	Explain effects of air pollution on plant and material	8
	B.	Enumerate causes of acid rain and effects of acid rain	7
	C.	What is air sampling and why do we need to sample air	5

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T.E - (Civil) (Sem-VI) (Revised Course 2019-2020)
EXAMINATION DECEMBER 2023
Air and Noise Pollution and Control

[Time: 3:00 Hours] **[Max. Marks:100]**

Instructions:
I) Marks are indicated to the right of the question.
II) Each question is of total 20 marks.
III) Answer total 5 questions, 2 questions from Part A, 2 questions from Part B and 1 question from Part C.
IV) Assume any additional data if required and mention it clearly.

Part- A

Q1 a) What are the methods of identifying air pollution.? **8**

b) What are the sources of air pollution describe in tabular form of their class, Aerosols, gases and vapours? **6**

c) Define the following terms **6**

i) Smog ii) Mists iii) Aerosols

Q2 a) Describe the effect of air pollutants on human health and on plants. **12**

b) Describe the heat island effect and its effects on environment. **8**

Q3 a) Describe Coning plume behavior and Lofting plume behavior along with neat diagram with all technical details. **8**

b) Explain the procedure for the collection of suspended particulate matter using high volume sampler along with neat diagram. **7**

c) Following observations are taken for High volume sampler. Find out the suspended concentration in $\mu g/m^3$ **5**

i) Average pressure of the day at station level = 712.60 mm Hg
ii) Average temperature = 30.5 ° C
iii) Actual Sampling time = 24 hours
iv) Sampling rate = 1.7 cu.m/min.
v) Filter after exposure = 1.6 cu.m/min
vi) Tare weight of filter before exposure = 3.518 gm
vii) Tare weight of filter after exposure = 3.839 gm

Part –B

Q4 a) What are the main principles of air pollution abatement? What are the objectives of using control equipment? 12

b) A factory uses 800000 litres of furnace oil Specific Density 0.97 per month. If for one litres of oil used per year, the Particulate matter emitted is 4.0 tonnes per year, SO_2 emitted is 59.7 tonnes per year, NO_2 emitted is 7.5 tonnes per year, HC emitted is 0.37 tonnes per year and CO emitted is 0.52 tonnes per year. Calculate the height of Chimneyrequired to be provided for safe dispersion of the pollutants. 8

Q5 a) Describe the Packed Towers along with neat diagram and what are its advantages and disadvantages? 12

b) Describe the effects of noise pollution on human health and also describe how to control noise pollution. 8

Q6 a) Explain with a neat diagram the construction and working of ESP. what are its advantages and disadvantage? 12

b) What are the ambient air quality standards in respect of noise? What do you understand by Indoor noise pollution and outdoor noise pollution? 8

Part –C

Q7 a) Explain the theory of formation of photochemical smog and what are its effects on environment? 10

b) Describe the Greenhouse effects along with neat diagram and impact of greenhouse effect on environment 10

Q8 Write short notes on the following

i) Settling chamber 7

ii) Acid rains effect 7

iii) Ambient Air Quality Standards 6

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T.E - (Civil) (Sem-VI)(Revised Course 2019-2020)
EXAMINATION JULY 2023
OPEN ELECTIVE Air and Noise Pollution Control

[Time: 3:00 Hours] **[Max. Marks: 100]**

Instructions:
i. Marks are indicated to the right of the question.
ii. Each question is of total 20 marks.
iii. Answer total 5 questions, 2 questions from part A. 2 questions from part B, and 1question from part C.
iv. Assume any additional data if required and mention it clearly.

PART A

Q.1 a) Define air pollution. How they are classified? Substantiate your answer with examples. **10**

b) Explain air sampling and pollution measurement methods. **10**

Q.2 a) Explain plume behavior with a neat diagram. **10**

b) Differentiate between Smog and Photochemical smog? Explain the mode of formation of each? **10**

Q.3 a) What do you understand by "Ozone hole" and its effects on environment. **10**

b) What are green house gases, Explain in detail. **10**

PART B

Q.4 a) Describe with neat diagram the functioning of wet collectors. What are its advantages and disadvantages? **12**

b) Explain Indoor and Outdoor noise propagation in detail. **8**

Q.5 a) Describe Electro Static Precipitators (ESP) with neat diagram? What are its advantages and disadvantages? **12**

b) Explain the monitoring procedure for noise measurement. **8**

Q.6 a) What is Noise pollution? Explain the sources of noise pollution? **8**

b) Describe fabric filter with neat diagram? What are its advantages and disadvantages? **12**

PART C

Q.7 a) Explain the effects of air pollution on human health. **10**

b) Plume dispersion. **10**

Q.8 Write short note on the following:

a) Acid Rain **7**

b) Ambient Air Quality Standards **6**

c) Settling chamber. **7**

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T.E. (Civil) Semester-VI (Revised Course 2019-20)
EXAMINATION JANUARY 2023
Open Elective - Air and Noise Pollution Control

[Time: Three Hours] **[Max. Marks:100]**

Instructions:
1. Marks are indicated to the right of the question.
2. Each question is of total 20 marks.
3. **Answer** total **5 questions, 2** questions from **Part A, 2** questions from **Part B** and **1** question from **Part C.**
4. Assume any additional data if required and mention it clearly.

Part A

Q1 a) Describe the classification of air pollutants. **10**
b) Differentiate between the point sources and area sources of pollutant. **6**
c) Define the following terms **4**
i) Fog ii) Smoke

Q2 a) Explain the various effects of air pollution on human. **10**
b) Describe ozone holes and its effects on environment. **10**

Q3 a) Describe plume behavior along with a neat diagram. **10**
b) Explain the role of meteorological elements in the dispersion of air pollutants in the atmosphere. **10**

Part B

Q4 a) What are the objectives of using control equipment? What are the main principles of air pollution abatement? **10**
b) Estimate the plume rise in neutral condition of the atmosphere for an industry emitting gas from the stack at 122^0C at a velocity of 13m/sec. The diameter of the stack is 2.8 m and the height 100 m, the ambient temperature is 31^0C and the wind speed is 6.05 m/sec at 100 m height. **10**

Q5 a) Describe electrostatic precipitators (ESP) along with neat diagram and what are its advantages and disadvantages? **12**
b) Describe the effects of noise pollution on health. State acceptable noise levels as per Indian Standard. **8**

Q6 a) Describe fabric filters along with neat diagram and what are its advantages and disadvantages? **12**
b) Explain acoustics with outdoor and indoor noise propagation. **8**

Part C

Q7 a) Explain the theory of formation of photochemical smog and what are its effects on environment? **10**
b) Describe Laboratory analytical methods of SPM measurements. **10**

Q8 a) Write short notes on the following
i) Cyclones **7**
ii) Greenhouse effects **7**
iii) Acid Rain **6**