Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– V EXAMINATION – SUMMER 2026

Subject Code:3151309 Date:06-06-2026

Subject Name: Fundamentals of Air Pollution

Time: 02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Write down the effects of Noise on human.	**03**
	(b)	Explain primary and secondary air pollutants with examples.	**04**
	(c)	Describe the effects of NOx on human health, vegetation & materials.	**07**
Q.2	**(a)**	How you collect representative sample of air?	**03**
	(b)	Explain the step by step procedure of stack monitoring.	**04**
	(c)	Write a short note on High Volume air sampler.	**07**
		OR	
	(c)	Explain in detail Isokinetic sampling and its importance.	**07**
Q.3	**(a)**	Write down the factors affecting Meteorological condition.	**03**
	(b)	Briefly explain the Heat Island Effect with neat sketch.	**04**
	(c)	Classify the plume behavior, explain it with diagram.	**07**
		OR	
Q.3	**(a)**	Define Maximum mixing depth and explain it with example.	**03**
	(b)	Classify the types of Inversion.	**04**
	(c)	Derive Dry Adiabatic Lapse Rate (DALR).	**07**
Q.4	**(a)**	Explain application of Wind rose diagram.	**03**
	(b)	Discuss wind velocity profile in detail with neat sketch.	**04**
	(c)	Classify the degree of stability of the atmosphere: (a) temperature at ground level is 35°C, temperature at 500 meter is 30°C; (b) ground-level temperature is 60°C; temperature at 800 meter is 50°C; (c) ground-level temperature is 40°C, temperature at 600 meter is 50°C; (d) ground-level temperature is 35°C, temperature at 700 meter is 15°C; (e) ground-level temperature is 40°C, temperature at 400 meter is 30°C; (f) ground-level temperature is 55°C, temperature at 700 meter is 40°C. DALR of the atmosphere is -9.8°C/km.	**07**
		OR	
Q.4	**(a)**	Explain solar radiation.	**03**
	(b)	Classify the stability condition of atmosphere and explain it.	**04**
	(c)	Derive all the equation for dispersion of the pollutant in the atmosphere and calculate the effective stack height.	**07**
Q.5	**(a)**	Enlist various type of Noise control Techniques.	**03**
	(b)	Enlist various sources of Noise pollution.	**04**
	(c)	Describe the episodes of London smog.	**07**

OR

Q.5	**(a)**	Enlist various odor control methods.	**03**
	(b)	Write down the equation for the Sound Intensity level, Sound Pressure Level, Sound Power Level, Equivalent Noise Level.	**04**
	(c)	Write a Brief note on Photochemical Smog and Hydrocarbon Reactivity.	**07**

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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – SUMMER 2025

Subject Code:3151309 Date:28-05-2025

Subject Name:Fundamentals of Air Pollution

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Write down the effects of SO_2 & Particulate Matter (PM) on Human health.	**03**
	(b)	Explain the Stationary & Mobile sources of air pollution with suitable examples.	**04**
	(c)	Define wind rose diagram & discuss its application in environmental engineering field.	**07**
Q.2	**(a)**	Differentiate between Environmental lapse rate (ELR) & Dry adiabatic lapse rate (DALR).	**03**
	(b)	Name the primary meteorology parameters that affects air pollution & define Coriolis force.	**04**
	(c)	Enlist the stability condition of atmosphere and explain any one type with diagram.	**07**
		OR	
	(c)	Write a short note on Heat Island effect with figure.	**07**
Q.3	**(a)**	Define the terms; 1. Wavelength 2. Sound power 3. Sound pressure	**03**
	(b)	Write a short note on effects of noise on Human.	**04**
	(c)	Discuss the six types plume behaviors with neat sketch.	**07**
		OR	
Q.3	**(a)**	Enlist the characterization of Odour.	**03**
	(b)	Give the classification of Odor pollution reduction technology.	**04**
	(c)	Differentiate between Radiation inversion & Subsidence inversion.	**07**
Q.4	**(a)**	Draw a neat sketch of high volume air sampler (HVAS) & label the components.	**03**
	(b)	With reference to atmospheric photochemical reaction, explain in detail Hydrocarbon reactivity.	**04**
	(c)	Write down the Gaussian dispersion equation & discuss the assumptions thereof.	**07**
		OR	
Q.4	**(a)**	Compare stack monitoring & ambient air quality monitoring.	**03**
	(b)	Enlist the photochemical oxidants and write the reactions of their formation.	**04**
	(c)	Write a down a procedure for determination of effective stack height.	**07**
Q.5	**(a)**	Draw general wind velocity profile for rural & urban area.	**03**
	(b)	The average daily concentration of SO_2 is observed to be 350 $\mu g/m^3$ at 25^0c and 1 atm pressure at a given location. What is the concentration of SO_2 in ppm. ?	**04**
	(c)	Briefly Explain the Iso-kinetic condition with neat sketch.	**07**
		OR	
Q.5	**(a)**	Write a short note on maximum mixing depth with neat sketch.	**03**

(b) Find out the flow of flue gas and particulate matter concentration in mg/Nm^3. Type of fuel is lignite (Mata no madh), fuel consumption is 1.5 T/day. Assume suitable data. **04**

(c) Define Traverse Point. Enlist the steps for particulate matter sampling from the point source. **07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2024

Subject Code: 3151309 Date:31-05-2024

Subject Name: Fundamentals of Air Pollution

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Write down the effect of SO_2 & CO on Human health.	**03**
	(b)	Give the classification of air pollutants with the examples.	**04**
	(c)	Write a short note on iso kinetic sampling.	**07**
Q.2	**(a)**	Write down the application of the following equipment; 1. Anemometer 2. Thermocouple 3. Manometer	**03**
	(b)	Make a list of fuels and name the potential air pollutants generated from each type of fuels.	**04**
	(c)	Define the Lapse Rate & Derive the Dry adiabatic lapse rate (DALR) dt/dz = 10^{o} C/100 m.	**07**
		OR	
	(c)	Enlist the stability condition of atmosphere and explain any one type with diagram.	**07**
Q.3	**(a)**	Define the terms; 1. Wavelength 2. Sound power 3. Frequency	**03**
	(b)	Write a short note on effects of noise on Human.	**04**
	(c)	Enlist Six types of Plume behaviors & explain any three types with neat sketch.	**07**
		OR	
Q.3	**(a)**	Enlist the characterization of Odour.	**03**
	(b)	Give the classification of Odor pollution reduction technology.	**04**
	(c)	Differentiate between Radiation inversion & Subsidence inversion.	**07**
Q.4	**(a)**	Discuss the need of representative sampling in air pollution monitoring.	**03**
	(b)	Explain the aesthetic, climatic, and related effects of air pollution.	**04**
	(c)	Write a short note on High Volume Air Sampler (HVAS).	**07**
		OR	
Q.4	**(a)**	Describe the episodes of London smog cause due to photochemical effect.	**03**
	(b)	Write a short note on Heat island effect.	**04**
	(c)	Explain the step by step procedure of stack monitoring.	**07**
Q.5	**(a)**	Draw general wind velocity profile for rural & urban area.	**03**
	(b)	The average daily concentration of SO_2 is observed to be 420 $\mu g/m^3$ at 25^0c and 1 atm pressure at a given location. What is the concentration of SO_2 in ppm. ?	**04**
	(c)	With reference to atmospheric photochemical reaction, explain in detail Hydrocarbon reactivity.	**07**

OR

Q.5 **(a)** Define the Wind rose diagram & discuss its application in environmental engineering field. **03**

(b) Find out the flow of flue gas and particulate matter concentration in mg/Nm^3. Type of fuel is lignite (Mata no madh), fuel consumption is 1.5 T/day. Assume suitable data. **04**

(c) Enlist the photochemical oxidants and write the reactions of their formation. **07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- V EXAMINATION-SUMMER 2023

Subject Code: 3151309 Date: 03/07/2023

Subject Name: Fundamentals of Air Pollution

Time: 02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Give the classification of sources of air pollution.	**03**
	(b)	Differentiate between primary & secondary air pollutants.	**04**
	(c)	Discuss the effects of oxides of sulfur (SOx) on Human health, Plants & Property.	**07**
Q.2	**(a)**	Define the terms: (1) Lapse Rate (2) Inversion (3) Maximum Mixing Depth (MMD)	**03**
	(b)	Enlist various types of plume behaviors & explain any two with figure.	**04**
	(c)	Write a short note on wind rose diagram.	**07**
		OR	
	(c)	Write a Short note on Gaussian Dispersion Model.	**07**
Q.3	**(a)**	Define the following terms: 1. Soot 2. Mist 3. Smoke	**03**
	(b)	Write the difference between sound & noise.	**04**
	(c)	Write short note on High Volume Air Sampler (HVAS).	**07**
		OR	
Q.3	**(a)**	Define the Heat Island effects with neat sketch.	**03**
	(b)	Enlist the meteorological factors influencing the air pollution.	**04**
	(c)	Differentiate between the stack gases sampling and ambient air sampling.	**07**
Q.4	**(a)**	Derive the relationship between ppm and $\mu g/m^3$.	**03**
	(b)	Enlist the four factors responsible for formation of photochemical smog.	**04**
	(c)	Discuss the effects of noise pollution on human health & list the methods for Noise pollution control.	**07**
		OR	
Q.4	**(a)**	Name the sources of odor pollution.	**03**
	(b)	Discuss various aspects of sampling to be considered while developing a sampling programme.	**04**
	(c)	Enlist odor control techniques and explain any three in detail.	**07**
Q.5	**(a)**	Write down the equations used for the determination of stack height.	**03**
	(b)	Discuss the Iso kinetic sampling in detail.	**04**
	(c)	Derive the equation of DALR (- dT/dz) = 9.8 ° C/km.	**07**
		OR	
Q.5	**(a)**	Differentiate between continuous, intermittent & impulse noise.	**03**
	(b)	Find out the flow of flue gas and particulate matter concentration in mg/Nm^3. Type of fuel is lignite (Mata no madh), fuel consumption is 4 T/day. Assume suitable data.	**04**
	(c)	Write a short note on Plume rise.	**07**

Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(NEW) EXAMINATION – SUMMER 2022

Subject Code:3151309 Date:07/06/2022

Subject Name:Fundamentals of Air Pollution

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Name the air pollutants & write down the effect of particulate matter on plants & human health.	**03**
	(b)	Give the example of the fugitive & line source of air pollution.	**04**
	(c)	Explain the working of the high-volume air sampler for the measurement of the particulate matter.	**07**
Q.2	**(a)**	List the types of plume behaviors.	**03**
	(b)	Differentiate between dry adiabatic & wet adiabatic lapse rate.	**04**
	(c)	Write a short note on the maximum mixing depth (MMD)	**07**
		OR	
	(c)	Write a short note on heat island effect.	**07**
Q.3	**(a)**	Name the instrument used for determination of the following atmospheric parameters; I. Wind speed & direction II. Humidity III. Rainfall	**03**
	(b)	Enlist the odor pollution control technology & explain any two in detail.	**04**
	(c)	Enlist various noise control strategies & explain any three in details.	**07**
		OR	
Q.3	**(a)**	Differentiate between noise & sound.	**03**
	(b)	Name the odor characteristics & their significance for odor pollution control.	**04**
	(c)	Write a short note on effects of noise on Human.	**07**
Q.4	**(a)**	Define the iso kinetic condition.	**03**
	(b)	Discuss the purposes of stack monitoring.	**04**
	(c)	Discuss the Gaussian dispersion equation assumptions in detail.	**07**
		OR	
Q.4	**(a)**	Write down the full form of the NAAQS.	**03**
	(b)	What are the basic requirements for carrying out the ambient air quality monitoring?	**04**
	(c)	Derive the equation of DALR (- $\boldsymbol{dT/dz}$) = 9.8 ° C/km.	**07**
Q.5	**(a)**	Name the major eye irritants present in the photochemical smog.	**03**
	(b)	Write down the equation for calculation of effective stack height.	**04**
	(c)	Write a short note on wind rose diagram.	**07**
		OR	
Q.5	**(a)**	Enlist the four factors responsible for formation of photochemical smog.	**03**
	(b)	Define Plume rise & write any two equation for determination of plume rise.	**04**
	(c)	Write a short note on plume rise.	**07**

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