# GUJARAT TECHNOLOGICAL UNIVERSITY
## BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2024

**Subject Code:3151309**                                      **Date:17-12-2024**
**Subject Name:Fundamentals of Air Pollution**
**Time:10:30 AM TO 01:00 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)** | Define Air pollution. Enlist and explain the sources of air pollution in detail. | **03** |
|     | **(b)** | Explain the effects of Particulate matter on human, animals and vegetation. | **04** |
|     | **(c)** | Derive an expression for the dry adiabatic lapse rate. | **07** |
| **Q.2** | **(a)** | Explain primary and secondary air pollutants with examples. | **03** |
|     | **(b)** | Describe the effects of Sulfur dioxide on human health, vegetation & materials. | **04** |
|     | **(c)** | Define Maximum mixing depth and explain it with example. | **07** |
|     |     | **OR** |     |
|     | **(c)** | Briefly explain the Heat Island Effect with neat sketch. | **07** |
| **Q.3** | **(a)** | Write Down the Factors Affecting Meteorological Condition? | **03** |
|     | **(b)** | The exhaust gas from an automobile contains 3% by volume of carbon monoxide. What is the concentration of CO in milligrams per cubic meter (mg/m$^3$) at 25.c and 1 atm pressure? | **04** |
|     | **(c)** | Explain Wind rose diagram and enlist its application. Discuss wind velocity profile in detail with neat sketch. | **07** |
|     |     | **OR** |     |
| **Q.3** | **(a)** | Define proximate and ultimate analysis of fuel. | **03** |
|     | **(b)** | The concentration of CO in cigarette smoke reaches level of 420 ppm or higher. For this particular value determine the percentage by volume and the concentration in milligram per cubic meter at 25 0 C and 1atm pressure. | **04** |
|     | **(c)** | Classify the plume behavior, explain it with diagram. | **07** |
| **Q.4** | **(a)** | Define following terms: (a) Aerosol (b) Mist (c) Fog. | **03** |
|     | **(b)** | Define Inversion and explain the subsidence and radiation inversion. | **04** |
|     | **(c)** | State the use of High volume sampler and also explain its working. | **07** |
|     |     | **OR** |     |
| **Q.4** | **(a)** | Explain in detail Isokinetic sampling. | **03** |
|     | **(b)** | Why Isokinetic Sampling is important in Stack Monitoring? Justify with example. | **04** |
|     | **(c)** | Explain the step by step procedure of stack monitoring. | **07** |

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| **Q.5** | **(a)** | Write down the effects of Noise on human. | **03** |
| | **(b)** | Briefly explain the characteristics of Noise. | **04** |
| | **(c)** | Explain the methods used for the control of Noise pollution. | **07** |

**OR**

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|---|---|---|---|
| **Q.5** | **(a)** | Define odor. Explain the characteristics of odor. | **03** |
| | **(b)** | Enlist factors affecting photochemical reaction. | **04** |
| | **(c)** | Enlist odor control techniques and explain any one. | **07** |

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