

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019****Subject Code: 2161302****Date: 04/12/2019****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 markss.

- |   | MARKS     |
|---|-----------|
| <b>Q.1</b> (a) Classify air pollutants into different categories and indicate their sources.  | <b>03</b> |
| (b) What are the important factors which contribute to air pollution?   | <b>04</b> |
| (c) Explain the effects of NO <sub>x</sub> on Environment.  | <b>07</b> |
| <b>Q.2</b> (a) Define :   | <b>03</b> |
| 1. Traverse points 2. Isokinetic condition 3. Representative sample.  |           |
| (b) Differentiate between stack standards and ambient standards.  | <b>04</b> |
| (c) Explain the guidelines for sampling and analysis of SO <sub>2</sub> in ambient air with the help of flow chart.   | <b>07</b> |
| <b>OR</b>   |           |
| (c) Explain the procedure of the particulate matter sampling from stack with diagram.   | <b>07</b> |
| <b>Q.3</b> (a) Differentiate between fumigation and lofting.  | <b>03</b> |
| (b) Write a short note on MMD.  | <b>04</b> |
| (c) Derive the equation of DALR ( $-dT/dz$ ) = 9.8 ° C.   | <b>07</b> |
| <b>OR</b>   |           |
| <b>Q.3</b> (a) Differentiate between Super adiabatic and sub adiabatic condition.   | <b>03</b> |
| (b) Write a short note on Wind velocity profile.  | <b>04</b> |
| (c) Enlist the factors affecting the dispersion of pollutants in the atmosphere? Note down the advantages and disadvantages of Gaussian Model.  | <b>07</b> |
| <b>Q.4</b> (a) Define following terms:  | <b>03</b> |
| 1. Convective Turbulence 2. Downwind 3. Dispersion  |           |
| (b) Briefly explain applications of windrose diagram.   | <b>04</b> |
| (c) Find out the flow of flue gas and particulate matter concentration in mg/Nm <sup>3</sup> . Type of fuel is lignite (Mata no madh), fuel consumption is 5 T/day. Assume suitable data. | <b>07</b> |
| <b>OR</b>   |           |
| <b>Q.4</b> (a) Define following terms:  | <b>03</b> |
| 1. Mechanical Turbulence 2. Sea breeze 3. Trapping  |           |
| (b) Differentiate between Subsidence and Radiation inversion.   | <b>04</b> |
| (c) The result of stack monitoring report for the thermal power plant are as shown below:   | <b>07</b> |

Stack No.	SO <sub>2</sub> Concentration	NO <sub>2</sub> Concentration
1	200	2
2	400	1.5
3	600	1.2
4	700	3.5
Stack limit	100 ppm	50 ppm

Determine whether an emission exceeds the limits specified by pollution control authority. If yes by how much percent?

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- Q.5** (a) Express  $30\mu\text{g}/\text{m}^3$  and  $1.5\mu\text{g}/\text{m}^3$  of  $\text{SO}_2$  in ppm. **03**  
(b) How to reduce the odor from the point sources? Explain any one method in detail. **04**  
(c) Write a short note on characteristics of sound. **07**

**OR**

- Q.5** (a) A diesel vehicle emits 4% carbon monoxide by volume. Determine its concentration in  $\text{g}/\text{m}^3$  at  $25^\circ\text{C}$  and 1 atmosphere pressure. **03**  
(b) What is decibel? Explain in detail. Why it is used? **04**  
(c) Define odour and explain sources of odour. **07**

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