

**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013****Subject code: 1721707****Date: 05-06-2013****Subject Name: Air Pollution Control****Time: 10.30 am – 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.

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| <b>Q.1</b> | (a) Discuss the effects of acid rain.                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>07</b> |
|            | (b) Explain the causes and effects of inversion of atmosphere.                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>07</b> |
| <b>Q.2</b> | (a) Explain environmental lapse rate and adiabatic lapse rate in detail.                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>07</b> |
|            | (b) Discuss the meteorological parameters that influence the air pollution.                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>07</b> |
|            | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |
|            | (b) Describe the different atmospheric conditions which give rise to different kinds of plumes with neat sketches.                                                                                                                                                                                                                                                                                                                                                                              | <b>07</b> |
| <b>Q.3</b> | (a) What are the methods of collecting gaseous samples from a stack? Describe any one of them with a neat sketch.                                                                                                                                                                                                                                                                                                                                                                               | <b>07</b> |
|            | (b) A factory uses 2, 20,000 litres of furnace oil per month. If for 1 ML of oil used per month, the particulate matter emitted is 2.8 tonnes per year, SO <sub>2</sub> emitted is 60.0 tonnes per year, NO <sub>x</sub> emitted is 7.5 tonnes per year, hydrocarbons emitted are 0.37 tonnes per year and CO emitted per year is 0.52 tonnes, then calculate the height of the chimney required to be provided for safe dispersion of the pollutants. Assume working days of year as 300 days. | <b>07</b> |
|            | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |
| <b>Q.3</b> | (a) List out various methods of sampling and describe any one in detail.                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>07</b> |
|            | (b) What do you mean by air quality standards? Give the Indian air quality standards for residential, industrial and sensitive areas.                                                                                                                                                                                                                                                                                                                                                           | <b>07</b> |
| <b>Q.4</b> | (a) With a neat sketch, explain the principle, construction and working of a cyclone separator.                                                                                                                                                                                                                                                                                                                                                                                                 | <b>07</b> |
|            | (b) Discuss the factors to be considered while selecting suitable control equipment for particulate removal.                                                                                                                                                                                                                                                                                                                                                                                    | <b>07</b> |
|            | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |
| <b>Q.4</b> | (a) With a neat sketch, explain the principle, construction and working of an electrostatic precipitator.                                                                                                                                                                                                                                                                                                                                                                                       | <b>07</b> |
|            | (b) Enumerate the common methods of control for gaseous pollutants and describe any one of them in detail.                                                                                                                                                                                                                                                                                                                                                                                      | <b>07</b> |
| <b>Q.5</b> | (a) Discuss the recent developments in the automobile industry to reduce vehicular pollution.                                                                                                                                                                                                                                                                                                                                                                                                   | <b>07</b> |
|            | (b) Write short notes on                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |
|            | (i) air- fuel ratio                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>04</b> |
|            | (ii) crank-case emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>03</b> |
|            | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |
| <b>Q.5</b> | (a) How automobile emission can be controlled? Explain various methods for it.                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>07</b> |
|            | (b) Discuss various pollutants emitted from automobiles. Also explain its impacts on human health and environment.                                                                                                                                                                                                                                                                                                                                                                              | <b>07</b> |

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