

SEMESTER-III (Pool-B)

COURSE NAME : Air Analysis

(CHOI-B14)

Number of Credit: - 02

Maximum marks: 50

Paper... : CHOI-B... : Air Analysis

Contact Hours/Week : 04 Hours/Week **Maximum Marks** : 50 Marks
Total Hours/Semester : 60 Hours/Semester **Minimum Pass Marks** : 20 Marks
Duration of Examination : 04 Hours/Paper **Nature of Examination** : Practical

Conduction of Examination: End semester examination will not be conducted at university level. It will be conducted internally at the department/college level after completion of the semester. Marks/grades will be filled by the concern department/college and hard copy of the same will be sent to the University for declaration of result.

Distribution of Marks:

S. No.	Name of Exercise	Marks
1.	Exercise No. 1	15
2.	Exercise No. 2	15
3.	Practical Record	05
4.	Good Laboratory Skills and Regularity in Practicals	05
5.	Comprehensive Viva-voce	10
Total Marks		50

Theory:

Introduction to Air Pollution: Air and its composition, Air Pollution, Sources of air pollution and its classification, Major air Pollutants and their characteristics, Specific group pollutants such as CFC, GHG etc. Air Pollutants from Various Industrial Sectors, Impact of Air Pollution on Human Health and Vegetation.

Air Quality: Introduction to Air Quality Index and Comprehensive Environmental Pollution Index etc., and its Application, Sampling and Measurement of Air Pollutants, Introduction to National Ambient Air Quality Standards.

Impacts of Air Pollution: Extreme air Pollution scenarios: Acid Rain, Global Warming, Smog, Ozone Layer Depletion etc. Various Treaties and Protocols: Kyoto Protocol and Montreal Protocol etc.

Control methods and equipment: Introduction to Control Methods and Equipment for Particulate Matter and Gases, Design and Working of Scrubbers, Electrostatic Precipitator, Gravity Settlers, Cyclone Separator, Filter Bags etc., Other Mechanisms of Air Pollution Control such as Biochemical Processes, Catalytic Processes etc.

Practical:

1. Determination of Sulphur dioxide (SO₂) in ambient air by West and Geake method.
2. Determination of oxides of Nitrogen (NO_x) in ambient air by Jacob Hochheiser (Sodium Arsenate method)
3. Measurement of meteorological parameters in the ambient air.
4. Measurement of indoor air quality using microbial air sampler
5. Determination of Ammonia in ambient air.
6. Determination of ground level Ozone in ambient air.
7. Determination of CO in ambient air.
8. Determination of Suspended Particulate Matter (SPM) in ambient air.
9. Determination of Respirable Suspended Particulate Matter (RSPM) in ambient air.
10. Determination of Air Quality Index.
11. Determination of Settable particles using dust fall jar apparatus.
12. Determination of Sulphation rate by Lead Peroxide method.
13. Construction and interpretation of wind roses and pollution roses.
14. Determination of trace metal in ambient air.
15. Air pollution study with respect to vegetation: Estimation of total dust.
16. Collection and analysis of plant leaves from heavy traffic area for estimation of trace metal.
17. Effect of air pollutants on plants with respect to leaf injury such as chlorosis, necrosis
18. Demonstration on Wind Monitoring and Analysis of Data for Wind rose Diagram
19. Vehicular emission test using auto exhaust analyser for petrol and diesel vehicles.
20. Stack Sampling Techniques and Demonstration of Stack Monitoring.
21. Demonstration / Exercises on Air Pollution Control Devices - Bag Filter, Scrubber, Cyclone and ESP.

Text & Reference Books:

- Environmental Pollution Control and Engineering, Rao C.S., New Age International (P) Limited, 1st Ed., 1991
- Air Pollution, Perkin, H.G. McGraw Hill 1974
- Air Pollution. Physical and Chemical Fundamentals, Sainfeld, J.H. McGraw Hill, N.Y.
- An Introduction to air Pollution – R.K.Trivedi and P.K.God (1998) Technology Pub.
- Air Pollution: Measurement, Modeling and Mitigation, A Tiwari and J Colls, Taylor & Francis, 2010
- Sources and Control of Air Pollution, R J Heinsohn and R L Kabel, Prentice Hall, 1999
- Air Pollution Control Equipment Calculations, L Theodore, John Wiley and Sons, 2008
- Catalytic Air Pollution Control, Hack, Furraoto and Gulati, John Wiley and Sons, 2009

Indian Codes of Practice:

1. IS 5182-23 (2006) Methods to measure Air pollution AIR POLLUTION ACT, 1981

