ENVIRONMENT ENGINEERING

Paper Code: ETCE-422	**L**	**T**	**C**
Paper: Environment Engineering	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objectives: *The subject deals with primary and secondary air pollutants, monitoring and standards of various pollutants in ambient air, indoor air pollution and noise measurement, occupational noise, handling and management of municipal hazardous and bio-medical waste.*

UNIT – I

Concept of unpolluted air, Gaseous and vapour pollutants in atmosphere, Scales of air pollution, Primary and secondary pollutants, Ambient Air Quality [AAQ], Monitoring for pollutants [SO_2, NO_2, O_3, Particulates and their health effects. Stack monitoring for SOx, NOx and CO. Effects of air pollution on materials, structures and Human health. Air quality criteria, National air emission standards and AAQ guidelines, Indoor Air pollution. Control and management of indoor and outdoor Air pollution. Green house gases Green house effect, Global warming.

[T1,T2][No. of Hours: 12]

UNIT – II

Characteristics and Sources of noise, Legal aspects: Standards of noise, Legislation in India Types of noise: Neighborhood noise, Traffic noise, Occupational noise, Community noise, Health effects of noise, Physiological hazard and Psychological hazard. Occupational noise-exposure, Noise measuring equipments such as Sound Level Meter. Control of Noise pollution in industrial, residential and silent zone.

Sources, Composition and Properties of Municipal solid waste, Handling and Separation of solid waste, Introduction to Municipal Waste [Management and Handling Rules, 2000], Disposal of Municipal Solid Wastes.

[T1,T2][No. of Hours: 11]

UNIT – III

Solid Waste Collection and Transportation: Types of collection systems [Hauled- container system and Stationary container system], Collection routes and their Layout, Solid waste Transfer Stations. Landfills: Classification, Types and methods, site selection, site preparation. Composition, Characteristics.

[T1,T2][No. of Hours: 11]

UNIT – IV

Generation and Control of Landfill gases, Composition, formation, movement and control of lechate in landfills, landfill design.

Composting: Theory of composting, manual and mechanized composting,

Characterization, Storage and Segregation of hazardous and biomedical waste

Techniques of hazardous and biomedical waste management.

[T1,T2][No. of Hours: 11]

Text Books:

[T1] M.N. Rao and H.V.N. Rao- Air Pollution, Tata McGraw- Hill

[T2] Mackenzige L. Davis, David A. Cornwell, "Introduction to environmental engineering, McGraw-Hill-International Edition.

References Books:

[R1] George Tchobanoglous, Hilary Theisen, Samuel A Viquel-Integrated Solid Waste Management: Engineering, Principles and Management issues", McGraw-Hill- International Editions

[R2] Michael D. LaGrea, Phillip L. Buckingham, Jeffrey C. Evans-Hazardous Waste Management and Environmental Resource Management, McGraw-Hill- International Edition

[R3] Howard S. Peavy, Donald R. Rowe, George Tchobanoglous-Environmental Engineering, Mcraw-Hill-International Editions.

[R4] Lawrence K. Wang, Norman C. Pereira-Advanced Air and noise pollution control, Humana Press

[R5] Kenneth Wark, Cecil F. Warner-Air pollution its origin and control, PHI