

INDUSTRIAL WASTE MANAGEMENT

Paper Code: ETEN-306

Paper: Industrial Waste Management

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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 12.5 marks.

***Objectives:** The overall aim of the subject is to give deeper knowledge in the problems and possibilities of waste management from various water/air polluting industries. The course will employ a holistic view on the solutions, recycle and reuse opportunities as well as examine feasibility and technical aspects.*

UNIT I

Standards for disposal of treated industrial wastewaters into water bodies, municipal sewer and land, Standards for disposal of industrial solid wastes and gaseous emission from various industries and treatment systems such as incinerator etc.

Industrial waste generation (solid and liquid waste and gaseous emission) and their characteristics, variation in its quality and quantity, Estimation of capacity of equalization tank.

Industry specific physico-chemical and biological treatment requirements, alternatives and their evaluation in respect of treatment.

[T1, T2][No. of Hours: 10]

UNIT II

Waste streams (solid, liquid and gaseous), their characteristics and manufacturing processes of integrated steel plant, sponge iron unit, alumina/aluminum manufacturing unit, copper smelter, fertilizer plant, thermal power plant, distillery/brewery, paper/pulp industry, tannery, textile unit and oil refinery. Case Studies.

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

UNIT III

Methods of waste reduction such as process modification, volume and strength reduction, segregation, reuse, recycle, material conservation, good housekeeping. Neutralization, equalization, precipitation and solidification. Economic feasibility of joint treatment of raw industrial effluent with municipal sewage. Need assessment and design of common effluent treatment plant for industrial estates.

Planning and management of industrial wastes (solid, liquid and gaseous) from small scale industries.

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

UNIT IV

Selection of unit operations and their design for treatment and management of wastes (solid, liquid and gaseous) from integrated steel plant, sponge iron unit, alumina/aluminum manufacturing unit, copper smelter, fertilizer plant, thermal power plant, distillery/brewery, paper/pulp industry, tannery, textile unit and oil refinery. Case Studies.

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

Text Books:

[T1] Wesley W., Eckenfelder Jr., "Industrial Water Pollution Control", Tata McGraw Hill

[T2] Mahajan S.P., "Pollution Control in Process Industries", Tata McGraw Hill Education (P) Ltd.

Reference Books:

[R1] Nemerow N.L and Agardy F.J., "Strategies of Industrial and Hazardous Waste Management", International Thomson Publishing Company, New York.

[R2] Crites R.W., Reed S.C. and Bastion R., "Land Treatment Systems for Municipal and Industrial Wastes", Tata McGraw Hill Publishing Company Ltd., New Delhi.

[R3] Ostler, N.K., "Industrial Waste Steam Generation", PHI Learning (P) Ltd., New Delhi.