

ELECTIVE PAPER

MEN-E 204 : Solid Waste and waste water management

M.M.: 70

Unit I

Solid Waste – collection, Storage, segregation- transportation and disposal methods-sanitary land fills and their types, composting, aerobic digestion, incineration, types of incineration, pyrolysis and medical waste, technology options for biomedical waste treatment. Hazardous waste-Introduction, characteristics, resource conservation and recovery act, Classification of hazardous waste and handling of hazardous solid wastes. Radioactive wastes- sources, pollution, types of radioactive waste and their control and management.

Unit III

Recycling of Wastes , waste for Industrial, Agricultural and Domestic Purposes; Recycling of Metals, Reuse, recovery and ,reduction of paper and plastics; Recycling in Food Manufacturing, Beverages, Apparel, Leather, Paper, Pulp, Chemical and other industries; Fly Ash utilization. Waste Disposal Methods – composting, incineration, pyrolysis, medical waste disposal strategies.

Unit III

Water purification, Screening (coarse screen, medium screen, fine screen) . Treatment systems (sedimentation, coagulation, filtration – rapid sand filter, slow sand filter) , advantages and disadvantages. Disinfections – Methods of disinfections, chlorination, water softening process. Water quality- Drinking water quality standards-Irrigation standards- effluent standards – Minimal National Standards (MINAS). International standards as described by WHO and EPA.

Unit IV

Waste water treatment: Characteristics of waste water, primary treatment – sedimentation and flocculation, equalization, neutralization, secondary treatment – Aerated lagoons, Trickling Filters, Activated Sludge process, Oxidation pond, Aerobic and Anaerobic decomposition of sewage- A note on reverse osmosis. Tertiary treatment,- biological processes and sludge treatment.

Unit V

Economics of waste treatment: Benefits of pollution abatement, Primary, secondary and intangible benefits, Capital and operating cost of different treatment processes for industrial waste. Management of industrial wastewater through Volume reduction, Strength reduction, Neutralization, Equalization,

NOTE: The question paper shall consist of two sections (A & B). Section A shall contain ten short answer type questions of six marks each and student has to attempt any five questions in about 150 words each. Section B shall consist eight long answer type questions of ten marks each and student shall be required to attempt any four questions in detail. Questions shall be uniformly distributed from the entire syllabus. The previous year paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.