MEN-C 303 : Environmental Biotechnology M.M.: 70

UNIT – I

Introduction, History of vermtitechnology, ecology and distribution of earthworms, Types of earthworms, vermiculture techniques: Selection and suitable characteristics of Earthworm for Vermicomposting, vermicomposting methods. Vermiculture biotechnology and waste management, Waste management and resource recovery,Types of Vermiculture plants, Vermi filters, Nutrient value of worms and Vermicompost, Maintenance and limitations of vermi composting, Economics of vermiculture, Vermiwash, *In-situ* application of vermiculture for crop productivity, land improvement and soil reclamation.

UNIT – II

Biological waste and fish farming:Definition and types of biological wastes and their nutrient values, wastes recycling methods, Use of wastes as fertilizer and feed. Application of wastes in cultures of micro-algae, use of sludge, slurry and livestock wastes in Biogas formation, Intensive aquaculture: sewage fed fish culture (monoculture and polyculture), Integrated fish farming system.

UNIT – III

Environmental Biotechnology : Introduction and application, Biofertilizer technology: Rhizobium culture, Blue-green algae culture, *Azolla* culture, and *Micorrihizea* culture. Benefits and significance of biofertilizers in agriculture. Fermentation technology. Role of microorganisms in production of alcohol, and pharmaceutical products, biomass (Spirulina culture) production and bio-fuel production.

UNIT – IV

Biopesticides: definition, types (Plants, Biochemical, Bacterial Virus, Fungal and Entomopathogenic nematodes) Mode of application of biopesticides, Integrated pest management, Biological and ecological intensive IPM. Bioleaching: types of bioleaching, mechanism of bioleaching and significance.

UNIT -V

Genetically modified microorganisms (GMO) concepts and technology, Transgenic plants and vegetables, Transgenic and hybrid fishes, Tissue culture technology: micro propagation, somatic hybridization and clonal propagation, Intellectual property right (IPR) and protection, Plant breeder rights (PBR).

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.