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PAPER:IX GENE AND THE ENVIRONMENT

Unit:I A brief account of abiotic stress - A general account of environmental pollution - water pollution and abatement technology - Biological treatment - Primary, Secondary and tertiary treatments Gamma irradiation - Air pollution and Greenhouse effect - Radioactive pollution - Electrostatic precipitator - water quality parameter analysis - Entero bacteria (coliform) - multiple drug resistance - Drinking water quality.

Unit:II UV stress effects on plants - repair mechanism - photolyase sewage pollution - Distillery and dyeing industry effluents - Hospital wastes - Air pollution and its effects on vegetation and animals - Mechanism of heavy metal tolerance - Metallothioneins - Ozone holes - Role of biosensors in environmental monitoring.

Unit:III Bioremediation - Biodegradation of xenobiotics, pesticides, herbicides - Oil-biodegradation - Aliphatic and aromatic hydrocarbons and their aerobic and anaerobic oxidation - chemistry of the pathways - Hydrocarbon degraders - creation of superbug - Alkane degraders - Bioscrubbers - Bio-surfactants - curing of plasmids - A general account of ~~thath~~ methanogenesis - Methanogens - Chemistry of methane production - biogas plant - uses of methane - A general account of recycling of wastes.

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Unit:IV Induction of stress tolerance in plants - through gene transfer drought tolerance (BADH, Pro, Bet, mtl-D genes) Flooding tolerance (Anaerobic proteins - ADH genes) Saline tolerance (Ion exclusion, Osmotins etc) Freezing tolerance (Antifreeze proteins)

Unit:V Molecular aspects of stress tolerance O_2 radicals, SOD, peroxidases, Catalase, Antioxidant defense mechanism - Ascorbic acid, Carotenoids, Ascorbate peroidase cycle, Glutathione synthetase, ascorbic acid - Function of non-photosynthetic pigments.

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