

Module 1

Chapter 1 : Water Supply and Quality of Water

1-1 to 1- 20

1.1 Water supply : Water supply systems, water resources, types of intake structures, distribution systems of water and distribution layouts.

1.2 Quality of water : Introduction to pure water: potable, wholesome, palatable, distilled, polluted and contaminated water, drinking water standards and characteristics of water, water borne diseases.

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Module 2

Chapter 2 : Water Treatment

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2.1 WTP : Typical layout of WTP, Aeration, Types of Aeration systems, sedimentation, types of settling, tube settlers, design of sedimentation tank.

2.2 Coagulation and flocculation : Principle of coagulation, flocculation, Clari flocculator, coagulants aids.

2.3 Filtration : rapid sand filters, operation, cleaning and back-washing, Entire design of rapid gravity filter with under drainage system. Pressure filter : Construction and operation

2.4 Disinfection : Different methods of disinfection, chlorination and chemistry of chlorination, chlorine demand, free and combined chlorine, various forms of chlorine, types of chlorination. Numerical to calculate quantity of required chlorine doses.

2.5 Advanced and Miscellaneous Treatments : Water softening by lime soda process and by base exchange method, Reverse Osmosis, Activated carbon, Membrane filtration, Removal of Iron and Manganese.

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Module 3

Chapter 3 : Building Water Supply, Drainage and	
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3.1 Building water supply : Water demands, Per capita Supply, Service connection from main, Water meter.

3.2 Building drainage : basic principles, traps-types, location and function, Systems of Plumbing, anti siphonic and vent pipes.

3.3 Rainwater harvesting : Need for rainwater harvesting, Annual potential, Roof-top rain water harvesting. Numerical on annual rainwater harvesting potential.

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Module 4

Chapter 4 : Domestic Sewage and Sewerage System

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4.1 Sewage : Introduction to domestic sewage, and storm water, System of sanitation, Physical and chemical characteristics, decomposition of sewage, BOD, COD, numerical on BOD. MPCB norms for disposal of sewage effluent.

4.2 Sewerage system : Systems of sewerage and their layouts: Separate, Combined and partially combined system, merits and demerits, self-cleaning velocity and non-scouring velocity, Sewer- Shape, hydraulic design of sewers, Laying and testing of sewers, manhole-location, necessity, types and drop manhole, ventilation.

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Module 5

Chapter 5 : Sewage Treatment 5-1 to 5-70

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5.2 Introduction to Biological Treatment : Aerated lagoons, Oxidation ponds, oxidation ditches.

Self-purification of natural waterbodies : Oxygen economy, Disposal of treated effluent. Disposal of Raw and treated sewage on land and water, DO sag curve.

5.3 Rural and Low-cost sanitation : Septic Tank and Soak Pit –Operation, suitability and Design.

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Module 6

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