Module 1

Module 2

Module 3

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.

Module 4

4.1 Sewage : Introduction to domestic sewage, and storm water, System of sanitation, Physical and chemical haracteristics, 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.

Module 5

5.1 Treatment processes : Objective, methods of treatment, flow sheets showing Preliminary, Primary, Secondary and Tertiary treatment. Primary treatment : Screening, Grit removal, Oil and Grease removal, settling tank. Secondary Treatment Methods: Trickling filter-Principle, Process description and Design of trickling filter. Activated sludge process (ASP) - Principle, Process description, Recirculation of sludge, (numerical), Sludge volume index.

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

Self-purification of natural waterbodiess : 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.

Module 6

6.1 Air pollution : Composition of air, Quantification of air pollutants, Air quality standards, Effect of air pollution on Environment, Introduction to Air pollution control devices.

6.2 Noise pollution : Basic concept and measurement, Effects of noise, and control methods, and numerical on sound level.

6.3 Municipal Solid Waste Management : Sources, storage, treatment, disposal,5R Principles.

❑❑❑