PROGRAMME : CIVIL ENGINEERING **COURSE NAME : WATER SUPPLY AND WASTE WATER ENGINEERING** **COURSE CODE : TH-2** **SEMESTER : 5th sem** **PERIODS/WEEK: 5** **TOTAL PERIODS: 75**	**NAME OF THE FACULTY: MANASI PRADHAN**

WEEK	CLASS	TOPICS
1	1	WATER SUPPLY- Introduction to Water Supply, Quantity and Quality of water- Necessity of treated water supply,Per capita demand, variation in demand and factors affecting demand.
	2	Methods of forecasting population, Numerical problems using different methods
	3	**Impurities in water – organic and inorganic, Harmful effects of impurities.**
	4	Analysis of water –physical, chemical and bacteriological properties.
	5	Water quality standards for different uses.
2	1	Sources and Conveyance of water Surface sources–Lake, stream, river and impounded reservoir etc.
	2	Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well etc.
	3	Yield from well- method s of determination, Numerical problems using yield formulae, Intakes – types, description of river intake, reservoir intake, canal intakes
	4	Pumps for conveyance & distribution – types, selection, installation, Pipe materials – necessity, suitability, merits & demerits of each type Pipe joint–s necessity, types of joints,
	5	suitability, methods of jointing, methods,Laying of pipes.
3	1	Treatment of water- Flow diagram of conventional water treatment system.
	2	Treatment process / units :Aeration and it's Necessity, Plain Sedimentation and it's Necessity, working principles.
	3	Sedimentation tanks – types, essential features, operation & maintenance Sedimentation with coagulation: Necessity, principles of coagulation, types o coagulants, Flash Mixer, Flocculator, Clarifiers
	4	Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filte and Pressure Filter – essential features
	5	Disinfection : Necessity, methods of disinfection,Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, p-rcehlorination, break point chlorination, superchlorination
4	1	Softening of water – Necessity, Methods of softening – Lime soda process and Io exchange method.
	2	Distribution system And Appurtenance in distribution system: Gener requirements, types of distribution system-gravity, direct and combined system.
	3	Methods of supply – intermittent and continuous ,Distribution system layout – types, comparison, suitability.
	4	Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scou valves, Fire hydrants, Water meters.

	5	W/s plumbing in building :Method of connection from water mains to building supply ,General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.
5	**1**	WASTE WATER ENGINEERING-Introduction-Aims and objectives of sanitary engineering,Definition of terms related to sanitary engineering.
	2	Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability
	3	Quantity and Quality of sewage -Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.
	4	Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring velocity.
	5	General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological
6	**1**	Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD,COD
	2	Sewerage system-Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	3	Shapes of sewer – rectangular, circular, avoid-features, suitability
	4	Laying of sewer-setting out sewer alignments.
	5	Sewer appurtenances and Sewage Disposal
7	**1**	Manholes and Lamp holes
	2	Types of Manholes, features, location, functions.
	3	Inlets-features, location, function
	4	Grease & oil trap -features, location, function
	5	Storm regulator, inverted siphon- features, location, function
8	**1**	Disposal on land – sewage farming
	2	sewage application and dosing,
	3	Sewage sickness-causes and remedies
	4	Disposal by dilution – standards for disposal in different types of water bodies
	5	Self purification of stream.
9	**1**	Sewage treatment :Principles of treatment, flow diagram of conventional treatment.
	2	Primary treatment – necessity, principles
	3	Primary treatment-essential features, functions
	4	Secondary treatment – necessity, principles.
	5	Secondary treatment-essential features, functions
10	**1**	Sanitary plumbing for building :Requirements of building drainage,
	2	layout of lavatory blocks in residential buildings.
	3	layout of building drainage
	4	Plumbing arrangement of single storied buildings as per I.S. code.practice.
	5	Plumbing arrangements of multi storied building as per I.S. code.
11	**1**	Revision of chapter-1: Introduction
	2	Revision of chapter-2: Methods of forecasting population questions practice.
	3	Revision of chapter-3:Treatment of water
	4	Revision of chapter-4:Distribution system And Appurtenance in distribution

		system.
	5	Revision of chapter-5:W/s plumbing in building
12	**1**	Revision of chapter-6:objectives of sanitary engineering
	2	Revision of chapter-7: Quantity and Quality of sewage
	3	Revision of chapter-8:Sewerage system
	4	Revision of chapter-9:Sewer appurtenances and Sewage Disposal
	5	Revision of chapter-10:Sewage treatment
13	**1**	Revision of chapter-11:Sanitary plumbing for building
	2	Discussion of most probables questions (short types)
	3	Discussion of most probable questions (long types)
	4	Discussion of most probable questions (short types)
	5	Discussion of most probable questions (long types)
14	**1**	Discussion of previous year question papers
	2	Discussion of previous year question papers
	3	Discussion of previous year question papers
	4	Discussion of previous year question papers
	5	Discussion of previous year question papers
15	**1**	Discussion of previous year question papers
	2	Class test-short type questions
	3	Class test-long types questions
	4	Class test- both short and long types questions
	5	Class test-long types questions