DISCIPLINE:CIVIL	SEMESTER:5TH	NAME OF THE TEACHING FACULTY: SHREYAS PRADHAN & ASUTOSH MOHAPATRA
SUBJECT NAME:WATER SUPPLY & SANITARY ENGG.	No. of Days per Week Class Alloted: 3days	Semester From Date: 15/09/2022 To Date: 22/12/2022 No of Weeks :15
Week	Class Day	Theory Topics
September-3rd week September-4th week	September-3rd week-Day-1,2,3 September-4th week-Day-1,2,3	SECTION A: WATER SUPPLY 1 Introduction to Water Supply, Quantity and Quality of water 1.1 Necessity of treated water supply 1.2 Per capita demand, variation in demand and factors affecting demand 1.3 Methods of forecasting population, Numerical problems using different methods 1.4 Impurities in water – organic and inorganic, Harmful effects of impurities 1.5 Analysis of water –physical, chemical and bacteriological 1.6 Water quality standards for different uses
October-1st week October-2nd week	October-1st week-Day-1,2,3 October-2nd week-Day-1,3	2 Sources and Conveyance of water 2.1 Surface sources – Lake, stream, river and impounded reservoir 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well 2.3 Yield from well- method s of determination, Numerical problems using yield formulae (deduction excluded) 2.4 Intakes – types, description of river intake, reservoir intake, canal intake 2.5 Pumps for conveyance & distribution – types, selection, installation. 2.6 Pipe materials – necessity, suitability, merits & demerits of each type 2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method
October-2nd week	October-2nd week-Day-1	class test
October-2nd week October-3rd week October-4th week	October-2nd week-Day-2 October-3rd week-Day-1,2,3 October-4th week-Day-1,2,3	3 Treatment of water Note: 1. Design of treatment units excluded. 2. Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment 3. Field visit to treatment plant, under practical should be arranged after covering this unit. 3.1 Flow diagram of conventional water treatment system 3.2 Treatment process / units : 3.2.1 Aeration ; Necessity 3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only) 3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features 3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super chlorination 3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)
October-5th week November-1st week	October-5th week-Day-1,2,3 November-1st week-Day-1,3	4 Distribution system And Appurtenance in distribution system: 4.1 General requirements, types of distribution system-gravity, direct and combined 4.2 Methods of supply – intermittent and continuous 4.3 Distribution system layout – types, comparison, suitability 4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters
November-1st week	November-1st week-Day-2	5 W/s plumbing in building : 5.1 Method of connection from water mains to building supply 5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code
November-2nd week	November-2nd week-Day-1,2,3	SECTION B: WASTE WATER ENGINEERING 6 Introduction 6.1 Aims and objectives of sanitary engineering 6.2 Definition of terms related to sanitary engineering 6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability
November-3rd week November-4th week	November-3rd week-Day-1,2,3 November-4th week-Day-1	7 Quantity and Quality of sewage 7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage. 7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring 7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological 7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
November-3rd week	Day-1	Internal Assesment
November-4th week November-5th week	November-4th week-Day-2,3 November-5th week-Day-1	8 Sewerage system 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability 8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability 8.3 Laying of sewer-setting out sewer alignmen
November-4th week December-1st week	November-5th week-Day-2,3 December-1st week-Day-1,2	9 Sewer appurtenances and Sewage Disposal: 9.1 Manholes and Lamp holes – types, features, location, function 9.2 Inlets, Grease & oil trap – features, location, function 9.3 Storm regulator, inverted siphon – features, location, function 9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
December-1st week December-2nd week December-3rd week	December-1st week-Day-3 December-2nd week-Day-1,2,3 December-3rd week-Day-1	10 Sewage treatment : (Note: 1.Design of treatment units excluded. 2.Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment. 3.Field visit to treatment plant, under practical should be arranged after covering this unit.) 10.1 Principles of treatment, flow diagram of conventional treatment 10.2 Primary treatment – necessity, principles, essential features, functions 10.3 Secondary treatment – necessity, principles, essential features, functions
December-3rd week	December-3rd week-Day-2,3	11 Sanitary plumbing for building : 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage 11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice 11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti syphonage pip
December-3rd week	December-3rd week-Day-3	Class test

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