BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B.ARCH. **SEMESTER : IV**
BRANCH: ARCHITECTURE **SESSION : SP/2023**

SUBJECT: AR251 BUILDING SERVICES-I: WATER SUPPLY & SANITATION

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	How do you calculate the water demand of a household living in a city with a sewerage system? Explain with an example. Briefly explain the water treatment process with a diagram.	[5]	CO1& CO2	Knowledge & Application
Q.1(b)	Draw and explain different water distribution systems and distribution layouts. Explain their advantages and disadvantages.	[5]	CO1	Knowledge
Q.2(a)	Define Sewage, Sullage, Soil Pipe, and Waste Water Pipe. Discuss different types of plumbing systems with neat sketches.	[5]	CO3	Knowledge & Understanding
Q.2(b)	Draw and explain Manholes, Catchbasins, and different storm/overflow regulators types.	[5]	CO3	Knowledge & Understanding
Q.3(a)	Differentiate between Floor Drain and Floor Trap. Sketch and explain different types of floor traps based on shape and functionality.	[5]	CO3	Knowledge & Understanding
Q.3(b)	Draw a layout plan and a section (mounting height) of a toilet explaining the minimum space required for the following fixtures: Wash basin, Water Closet, Urinals, Shower Heads & Health.	[5]	CO5	Analysis & Application
Q.4	Design a Residence with two floors having two washrooms, a kitchen, and a powder room on the ground floor and two washrooms and two balconies on the first floor. Draw the plumbing drawing showing the layouts and drainage scheme of waste water, soil waste and storm water at the Ground floor, first floor, and Terrace.	[10]	CO5	Analysis & Application
Q.5(a)	Draw a flowchart explaining the primary and secondary treatment of Sewage. Explain the color coding of different solid wastes.	[5]	CO3	Knowledge & Understanding
Q.5(b)	What is Anaerobic Digestion? Draw a section and explain different components (parts) of a Septic tank and layers of solid waste in a Septic Tank. How do you identify a failing Septic Tank.	[5]	CO4	Understanding & Analysis

::::::24/04/2023::::::M