

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

CLASS: B.ARCH.
BRANCH: ARCHITECTURE

SEMESTER : 4TH
SESSION : SP/2024

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.
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Q.1(a)	Briefly discuss the steps of Water Supply from the “Source” to “Respective buildings”. A domestic water tank has dimensions of 2.5mX1.5mX1.5m. As per the capacity of the water tank, how many persons per day will the tank be able to serve, if the dwelling unit is in a metro city.	[5]	CO CO1 & CO2	BL Understand & Apply
Q.1(b)	Discuss the problems encountered while supplying water to high-rise buildings. What measures can be suggested to overcome these challenges?	[5]	CO1	Understand, & Analyze
Q.2(a)	What are the different methods of collection and disposal of “Refuse” from buildings? Sketch and explain Composting and Sanitary Landfilling.	[5]	CO3	Understand
Q.2(b)	An RCC roof having an area of 20mx10m receives an average rainfall of 500 mm per year. Calculate the amount of rainwater harvested from the RCC roof in liters yearly (Run-off Coefficient of RCC roof is 0.8). Sketch and explain different plumbing systems adopted in buildings.	[5]	CO3 & CO4	Understand &
Q.3(a)	Design a Toilet (WC+Bathing) of Size 1500mm X 2700mm. In the design explain the minimum space (dimensions) required by different fixtures. Further, with the help of Section (s) specify the mounting height of different fixtures as per Indian Standards.	[5]	CO4	Understand, Apply & Create
Q.3(b)	What is the function of a trap in a plumbing system? Sketch and explain different types of Traps based on shapes and functions.	[5]	CO3	Understand
Q.4	Design a Residence on a site of 50m X 100 m with a maximum 50% ground coverage abutting a 16 m wide road towards the shorter side (North line opposite the road). Further, sketch the Plans of the building (GF, FF (if applicable, and Terrace), and in the design highlight the plumbing schemes including water supply and wastewater disposal.	[10]	CO5	Understand, Apply & Create
Q.5(a)	Sketch the components of a Septic Tank. Design a Septic Tank for a colony of 500 persons provided with a water supply of 150lpcd. Assume other data required.	[5]	CO4	Understand
Q.5(b)	Explain the steps of the Sewage Treatment Plan with the help of a diagram. Explain Activated Sludge and Oxidation Pond in sewage treatment plant.	[5]	CO3	Understand

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