

GUJARAT TECHNOLOGICAL UNIVERSITY

3 SEMESTER – OLD PAPER – WINTER 2025 TO SUMMER 2026 – QUESTION BANK

Subject Name & Code: Water Supply and Sewerage System - BE03013011

Chapter 1: Water supply scheme: Importance & necessity of water supply scheme, importance and reliability of water works, essentials of water supply engineering

Repeated Questions:

None identified.

Other Important Questions:

None extracted from the provided papers.

Chapter 2: Sources of water: Surface water sources, ground water sources and terminology related to ground water, comparison of different sources based on quality and quantity

Repeated Questions:

1. Types of Water Sources (Theory):

- **Q.** List the different types of water sources used in water supply systems. / List the various surface and ground water sources available for a public water supply scheme. **(WINTER 2025, 3 Marks; SUMMER 2026)**

Other Important Questions:

1. Comparison and Selection of Water Sources (Theory):

- **Q.** Compare surface water and groundwater sources with respect to quality and reliability. **(WINTER 2025, 4 Marks)**
- **Q.** Discuss the importance of water quality parameters in selecting a water source. **(WINTER 2025, 7 Marks)**
- **Q.** State three factors that affect the selection of a water source. **(WINTER 2025, 3 Marks)**

2. Surface Water Sources (Theory):

- **Q.** Analyze the limitations of surface water sources for urban water supply with case examples. **(WINTER 2025, 7 Marks)**

Chapter 3: Demand of water quantity: Types of demand, per capita demand, design period, fluctuation in demand of water, factors affecting demand of water

Repeated Questions:

None identified.

Other Important Questions:

1. Types of Demand and Design Period (Theory):

- **Q.** What is design period? State the design periods for different components of water supply scheme. **(SUMMER 2026)**
- **Q.** State the various types of water demand considered in a municipal water supply scheme. **(SUMMER 2026)**

2. Population Forecasting (Theory):

- **Q.** Explain the 'Arithmetic Increase Method' and 'Geometric Increase Method' for population forecasting. **(SUMMER 2026)**
- **Q.** Write a short note on ideal population growth curve. **(SUMMER 2026)**

3. Numerical Problems:

- **Q.** Calculate the water demand for a city with 2,00,000 population if the average consumption is 235 lpcd. Express the result in Million Liters per Day (MLD). **(SUMMER 2026)**

Chapter 4: Pumps and Pumping stations: Need of pumping, classification of pumps, different type of pumps used in water supply, power of pumping, total lift of pump, H.P of pump, location of pumping station, site selection

Repeated Questions:

None identified.

Other Important Questions:

1. Need and Classification of Pumps (Theory):

- **Q.** State the need of pumping in a water supply scheme. **(WINTER 2025, 3 Marks)**
- **Q.** Recall the main classifications of pumps based on their mechanical action. **(SUMMER 2026)**

2. Pumping Systems and Horse Power (Theory):

- **Q.** Discuss the working and selection criteria of different pumping systems for municipal water supply. **(WINTER 2025, 7 Marks)**
- **Q.** Define how to calculate the horse power (HP) required for a pump. **(WINTER 2025, 4 Marks OR)**

Chapter 5: Collection and conveyance: Intakes, type of intake, conveyance of water, different type of pipes used in water supply, pipe-joints, laying of pipe, hydrostatic test

Repeated Questions:

1. River Intake Structure (Theory):

- **Q.** Illustrate with a neat sketch the intake structure for a river source. / What are various types of intake works? Describe a river intake with the help of a neat sketch. [Diagram required – refer to the original question paper] (**WINTER 2025, 4 Marks; SUMMER 2026**)

Other Important Questions:

1. Pipe Materials (Theory):

- **Q.** Classify the different types of pipe materials used for water conveyance and explain the suitability of 'Asbestos Cement' pipes. (**SUMMER 2026**)

Chapter 6: Distribution system: Type of distribution system, different layout of distribution system, methods of supplying water, pressures in distribution system, distribution resources and its capacity, type of reservoirs & accessories

Repeated Questions:

None identified.

Other Important Questions:

1. Distribution Layouts (Theory):

- **Q.** Draw layout of water distribution system and discuss units with its importance. [Diagram required – refer to the original question paper] **(WINTER 2025, 7 Marks OR)**
- **Q.** Compare dead-end and grid iron distribution layouts. **(WINTER 2025, 4 Marks)**

2. Methods of Supply and Reservoir Capacity (Theory):

- **Q.** Compare the merits and demerits of 'Continuous' versus 'Intermittent' water supply systems. **(SUMMER 2026)**
- **Q.** Briefly explain the utility of a 'Mass Curve' in determining reservoir capacity. **(SUMMER 2026 OR)**

3. Pipe Network Analysis (Theory):

- **Q.** Formulate the layout for a water distribution system using the 'Hardy-Cross Method' for pipe network analysis. Explain the expression for the flow correction factor. **(SUMMER 2026)**

Chapter 7: Valves and Fittings: Different type of valves, hydrants, meters, stop cock & water tap, pipe fittings, leakage & waste of water factors, affecting losses & wastes

Repeated Questions:

None identified.

Other Important Questions:

1. Valves (Theory):

- **Q.** List any types of valves used in a distribution system. **(WINTER 2025, 3 Marks OR)**
- **Q.** With the help of neat sketches, write short notes on the following: 1. Sluice valve, 2. Pressure relief valve, 3. Check-valve and 4. Drain valve. [Diagram required – refer to the original question paper] **(SUMMER 2026)**

2. Valves, Fittings and Water Loss (Theory):

- **Q.** Analyze the role of valves and fittings in minimizing water loss in urban distribution systems. **(WINTER 2025, 7 Marks OR)**

Chapter 8: Sanitary works: Definitions, sanitary works, objectives of sewage disposal

Repeated Questions:

None identified.

Other Important Questions:

1. Definitions (Theory):

- **Q.** Define sanitary sewage and storm sewage. **(WINTER 2025, 3 Marks)**
- **Q.** Define the terms: (i) Sewage, (ii) Sewer, and (iii) Sewerage system. **(SUMMER 2026)**

Chapter 9: Systems of sanitation: Methods of collection, conservancy systems, collection system, water carriage system, sewerage system

Repeated Questions:

None identified.

Other Important Questions:

1. Sewerage Systems (Theory):

- **Q.** Differentiate between combined and separate sewerage systems. **(WINTER 2025, 7 Marks)**

2. Conservancy and Water-Carriage Systems (Theory):

- **Q.** Examine why the 'Water-Carriage System' is preferred over the 'Conservancy System' in modern developing towns. **(SUMMER 2026)**
- **Q.** Describe the 'Conservancy System' of sanitation and its primary limitation. **(SUMMER 2026)**

Chapter 10: Quantity of sanitary and storm sewage: Sources of sanitary sewage, factors affecting and determination of quantity of sanitary sewage, factor affecting storm sewage and determination of quantity of storm sewage

Repeated Questions:

None identified.

Other Important Questions:

1. Storm Sewage Quantity (Theory):

- **Q.** Investigate the factors affecting the quantity of 'Storm Water Flow.' Explain how the 'Rational Method' is used to determine the quantity of storm sewage. **(SUMMER 2026 OR)**

Chapter 11: Design of sewers: Design period, per capita sewage flow, ground water infiltration, estimation of storm runoff, flow assumption, determination of velocity of flow

Repeated Questions:

None identified.

Other Important Questions:

1. Sewer Design Velocities (Theory):

- **Q.** Differentiate between 'Self-cleansing velocity' and 'Non-scouring velocity' in sewer design. (SUMMER 2026)

2. Numerical Problems:

- **Q.** Apply Manning's formula to calculate the diameter of a circular sewer required to carry a discharge of 500 liters/sec when flowing half-full at a slope of 1 in 400 (Assume $n = 0.013$). (SUMMER 2026)

Chapter 12: Drains and sewers: Drains, sewers, sections, sewer material, sewer drawings, corrosion prevention in sewers

Repeated Questions:

None identified.

Other Important Questions:

1. Sewer Sections and Joints (Theory):

- **Q.** Illustrate different sewer sections with neat sketches. [Diagram required – refer to the original question paper] **(WINTER 2025, 4 Marks)**
- **Q.** Distinguish between 'Drains' and 'Sewers.' Draw a labeled sketch of a 'Spigot and Socket Joint' and explain its assembly process. [Diagram required – refer to the original question paper] **(SUMMER 2026)**

2. Drains, Sewers and Water Supply Pipes (Theory):

- **Q.** What are the differences between water supply pipes and sewer pipes? **(SUMMER 2026 OR)**

3. Corrosion in Sewers (Theory):

- **Q.** Discuss the problems of corrosion in sewers and suggest preventive measures. **(WINTER 2025, 7 Marks OR)**

Chapter 13: Sewers appurtenances: Manhole, street inlet, flushing tanks, catch basins, inverted siphon, ventilation of sewers

Repeated Questions:

1. Inverted Siphon (Theory):

- **Q.** Describe the working of an inverted siphon with a neat sketch. / Identify the purpose of 'Inverted Siphons' in a sewerage network. [Diagram required – refer to the original question paper] **(WINTER 2025, 4 Marks OR; SUMMER 2026)**

Other Important Questions:

1. Sewer Appurtenances – General (Theory):

- **Q.** Define sewer appurtenances and give two examples. **(WINTER 2025, 3 Marks OR)**

2. Manholes and Ventilation (Theory):

- **Q.** Analyze the role of ventilation and manhole in sewer systems and its impact on public health. **(WINTER 2025, 7 Marks OR)**
- **Q.** Examine the construction of 'Manholes' and 'Drop Manholes.' Distinguish between them based on their specific application in a hilly terrain. **(SUMMER 2026)**

Chapter 14: Construction and maintenance of sewers: Laying of sewers, jointing of sewers, and hydraulic testing of pipe sewers, maintenance of sewers, sewer cleaning equipments and devices

Repeated Questions:

1. Hydraulic Testing of Sewers (Theory):

- **Q.** Discuss the importance of hydraulic testing during sewer construction. / Illustrate the procedure for conducting a 'Hydraulic Testing' of newly laid pipe sewers. **(WINTER 2025, 7 Marks; SUMMER 2026)**

Other Important Questions:

1. Sewer Cleaning and Maintenance (Theory):

- **Q.** State any three sewer cleaning devices and materials used for sewer construction. **(WINTER 2025, 3 Marks OR)**
- **Q.** Explain the methods of maintenance of sewers. **(WINTER 2025, 4 Marks OR)**

Chapter 15: House plumbing: Terms, Plumbing tools, traps and system of plumbing

Repeated Questions:

None identified.

Other Important Questions:

1. Plumbing Systems (Theory):

- **Q.** List different types of plumbing systems. **(WINTER 2025, 3 Marks)**

2. Traps (Theory):

- **Q.** Explain the role of traps in plumbing with sketches. [Diagram required – refer to the original question paper] **(WINTER 2025, 4 Marks)**
- **Q.** Analyze the various types of 'Traps' used in house plumbing. Develop a short note on the requirements of a 'Good Trap' and draw a 'P-trap'. [Diagram required – refer to the original question paper] **(SUMMER 2026)**
