



SIDDHARTH GROUP OF INSTITUTIONS:: PUTTUR

Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: Environmental Engineering (16CE133) **Course & Branch:** B.Tech & Civil

Year & Sem: IV-B.Tech & I-Sem

Regulation: R16

UNIT-I

**INTRODUCTION TO WATER SUPPLY,
WATER DEMAND AND QUANTITY STUDIES**

1. a) What are the necessities and importance of water supply scheme? [L1] [6M]
b) Draw the flow chart of public water supply system. [L2] [6M]
2. a) Explain the factor affecting the per capita demand. [L2] [7M]
b) Explain in detail about the variations in rate of demand. [L2] [5M]
3. Explain the various types of water demand in detail. [L2] [12M]
4. List out the various methods of population forecasting and explain any two methods in detail. [L2] [12M]
5. The populations of 5 decades from 1960 to 2000 are given below in table. Find out the population 2010, 2020 & 2035 beyond the last known decade. By
(a) Arithmetic increase method
(b) Geometrical method [L4] [12M]

Year	1960	1970	1980	1990	2000
Population	25000	28000	34000	42000	47000

6. Population of a town as obtained from the census reports is as below: Estimate the population of the town by 2020 & 2030 by Incremental Increase Method & Decreasing Rate Method [L4] [12M]

Year	1980	1990	2000	2010
Population	55500	63700	71300	79500

7. Briefly explain the various sources of water. [L2] [12M]
8. a) Write short notes on design period considering the various factors. [L2] [6M]
b) What are points to be kept in mind while selecting a site for intake structure? [L1] [6M]
9. Define intakes. Explain any one of intake structure with neat sketch. [L2] [12M]
10. a) With sketch, explain the hydrologic cycle of water. [L2] [6M]
b) Write short notes on reservoir intakes. [L2] [6M]

UNIT-II
QUALITY AND ANALYSIS OF WATER, WATER TREATMENT
& ADVANCED WATER TREATMENT

1. Draw the layout and general outline of surface and subsurface water treatment plant. [L2] [12M]
2. a) What are the physical characteristics of water? [L1] [5M]
b) Explain any two physical characteristics of water. [L2] [7M]
3. a) Briefly explain any four chemical characteristics of water. [L2][6M]
b) Write short notes on different water borne diseases. [L2][6M]
4. a) List out any six drinking water standards with their effects. [L2] [5M]
b) Briefly explain the Lime soda or Zeolite process of water softening. [L2] [7M]
5. a) Write short notes on types of screens. [L2] [5M]
b) Compute the dimensions of continuous flow rectangular sedimentation tank for a population of 20000 persons with a daily per capita water allowance of 120 liters. Assume detention period to be 6 hours. [L4] [7M]
6. a) Write short notes on methods of coagulant feeding. [L1] [7M]
b) Write short notes on mechanical flocculator. [L2] [5M]
7. Explain the working principle of slow sand filter with the help of neat sketch. [L2] [12M]
8. a) Design a rapid sand filter to treat a city of population 100000 with an average percapita demand of 160 lpcd. [L4] [5M]
b) Compare slow sand filter with rapid sand filter. [L2] [7M]
9. a) List out the requirements of good disinfectant. [L2] [5M]
b) List the types of chlorination and explain break point chlorination in detail. [L1] [7M]
10. Write short notes on i) Iron and Manganese removal ii) Defluorination [L2] [12M]

UNIT-III
**WATER DISTRIBUTION, INTRODUCTION TO SANITATION &
ESTIMATION OF SEWAGE FLOW**

1. a) What are the requirements of a distribution system? [L1] [6M]
b) Write short notes on methods of distribution system. [L2] [6M]
2. With neat sketch, explain the different types of layouts of city water distribution system. [L2] [12M]
3. a) Write a note on Hardy Cross or equivalent pipe method. [L2] [6M]
b) Briefly explain the various methods of waste water detection? [L1] [6M]
4. With neat sketch, explain the house service connection from a street main. [L2] [12M]
5. Compare between conservancy system and water carriage system. [L2] [12M]
6. a) What do you understand by dry weather flow? [L1] [6M]
b) Discuss in brief the various factors affecting the dry weather flow. [L2] [6M]
6. A certain district of a city has a projected population of 80000 residing over an area of 70 hectares.
Find the design discharge for the sewer line, for the following data:
 - (i) Rate of water supply = 200 LPCD
 - (ii) Average impermeability coefficient for the entire area = 0.3
 - (iii) Time of concentration = 50 minutes. [L4] [12M]
7. Give any five comparisons among three sewerage systems. [L2] [12M]
8. A main combined sewer is to be designed to serve an area of 12 sq.km with a population density of 250 persons/hectare. The average rate of sewage flow is 250 LPCD. The maximum flow of 100% in excess of average together with the rainfall equivalent of 15 mm in 24 hours, all of which are runoff. Determine the capacity of the sewer. Taking the maximum velocity of flow as 3 m/sec., determine the size of the circular sewer. [L4] [12M]
9. a) Mention the various sewer appurtenances in sewerage system. [L2] [5M]
b) Explain briefly catch basin with neat sketch. [L1] [7M]
10. a) Write a note on different types of sewer. [L2] [6M]
b) What should be the characteristics of materials to be used for sewers? [L1] [6M]

UNIT-IV

WASTE WATER CHARACTERISTICS & WASTE WATER TREATMENT

1. Write a note on various physical constituents of wastewater. [L2] [12M]
2. a) Define BOD & COD. [L1] [5M]
b) Write short notes on skimming tanks. [L2] [7M]
3. Draw the schematic diagram of typical sewage treatment plant and explain it. [L2] [12M]
4. Design a grit chamber for a maximum wastewater flow of 10000 m³/day to remove particles up to 0.25 mm dia, having specific gravity of 2.65. The settling velocities of these particles is found to range from 0.02 to 0.025 m/sec. Maintain a constant flow through velocity of 0.28 m/sec through the provision of a proportional flow weir [L4] [12M]
5. a) What is screening and types of screening? [L1] [5M]
b) Design a primary sedimentation for treating 1 MLD of wastewater. Make suitable assumptions. [L4] [7M]
6. Define activated sludge process with their operation including advantages and disadvantages. [L2] [12M]
7. Explain, with the help of neat sketch, the construction and working of a conventional trickling filter. [L2] [12M]
8. The sewage flows from a primary settling tank to a standard trickling filter at a rate of 5 MLD having a 5-day BOD of 150 mg/L. Determine the depth and the volume of the filter, adopting a surface loading of 2500 l/m²/day and an organic loading of 165 g/m³/day. Also, determine the efficiency of the filter unit, using NRC formula. [L4] [12M]
9. Compare between the conventional rate filter and high rate filter. [L2] [12M]
10. a) What do you understand by oxidation pond and explain the process of oxidation and stabilization? [L1] [7M]
b) Mention the advantages and disadvantages of oxidation ponds? [L2] [5M]

UNIT-V
DISPOSAL OF SEWAGE AND SLUDGE TREATMENT & DISPOSAL OF
SLUDGE

1. Explain, with the help of a flow chart, various processes involved in sludge treatment and disposal. [L2] [12M]
2. a) What do you understand by 'sludge digestion'? [L1] [6M]
b) Briefly explain the process involved in self-purification. [L2] [6M]
3. Explain the factors affecting the sludge digestion. [L2] [12M]
4. a) What do you understand by sludge thickening? [L1] [4M]
b) Describe, with the help of sketch the gravity-sludge thickener. [L2] [8M]
5. a) Why dewatering of sludge is necessary? [L1] [4M]
b) Explain the methods of dewatering the sludge on sludge drying beds. [L2] [8M]
6. Mention the various methods of sludge disposal and explain any two methods of sludge disposal. [L2] [12M]
7. Discuss the criterion for design of a septic tank. [L2] [12M]
8. a) What is a septic tank? [L1] [2M]
b) Design a septic tank for 200 persons assuming water supply as 120 LPCD. [L4] [12M]
8. Write a detailed note on design of Imhoff tank. [L1] [12M]
10. a) What is soak pit and why it is necessary? [L1] [6M]
b) With neat sketch, explain the process of dispersion trench. [L2] [6M]

Prepared by:
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