

(3 hours)

Marks : 80

N.B.

1. Question No 1 is compulsory
2. Attempt any three questions from the remaining five questions
3. Assume suitable data where ever required
4. Figures to the right indicate full marks

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| Q1. | a. | Explain the principle of sedimentation and the design parameters used. | 05 |
| | b. | Explain physical, chemical and biological impurities in water. | 05 |
| | c. | Write a note on rain water harvesting techniques. | 05 |
| | d. | Write a note on reverse osmosis. | 05 |
| Q2. | a. | Design a rectangular sedimentation tank to treat 5 MLD of water. Assume data wherever required and check for surface loading and weir loading | 10 |
| | b. | List the factors affecting the selection of site for intake structure. Also Draw a neat diagram of submerged intake structure. | 10 |
| Q3. | a. | Explain the process of coagulation and flocculation. Write about coagulant aids. | 10 |
| | b. | Draw a flow diagram showing sequence of various treatment units with river as a source. List these units sequentially state the function of each unit. | 10 |
| Q4. | a. | Define and Enlist different methods of water softening. Explain Zeolite process with neat Sketch | 10 |
| | b. | Explain different methods of disinfection and types of chlorination. | 10 |
| Q5. | a. | Design a rapid sand filter unit along with under drainage system for population of 200,000 which is to be served by a 200 l/head/day of water supply. Assume all the data and mention the same. | 10 |
| | b. | What are air pollutants and control measures for gaseous and particulate matter? Mention air quality standards. | 10 |
| Q6. | | Write short notes on (any four) | |
| | a. | Noise pollution and control | 05 |
| | b. | Fixture and Fittings of Building Water Supply | 05 |
| | c. | Aeration process and types | 05 |
| | d. | Slow sand filters | 05 |
| | e. | Water demands | 05 |
| | f. | Removal of iron and manganese. | 05 |