

QP Code : 15138

(3 Hours)

[Total Marks : 100

- N.B :** (1) Question no.1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) **Assume** suitable data, wherever **necessary**.

1. Answer any **four** 20
 - (a) Discuss the various factors affecting rate of demand.
 - (b) Explain different types of pollution and its effects on human health.
 - (c) What is ecology? Explain ecological pyramid.
 - (d) Explain different methods of water softening?
 - (e) Write a short note on surface water quality.

2.
 - (a) How are various impurities of water classified? Give examples of each. 10
 - (b) Draw a flow diagram showing components of water treatment plant. Explain the function of each unit. 10

3.
 - (a) Explain the different mechanisms of coagulation and its usefulness in removing impurities. 8
 - (b) Design a circular sedimentation tank fitted with mechanical sludge remover for a water work which has to supply daily 3.5 million litres of water to the town. The detention period in the tank is 3.0 hours and the depth of water in the tank may be assumed as 3.2 m. 12

4.
 - (a) Explain Infiltration gallery with a neat sketch. Where do you recommend this. 8
 - (b) Design a rapid sand filter to treat 2.5 ML/d watersupply for a town: given 6
 - (i) filter works for 12 hours a day. (ii) rate of filtration is 1350ML/d/ha.
 - (c) Compare Slow sand filter and Rapid sand filter. 6

5.
 - (a) What is meant by coagulation? What are the common coagulants used? Describe the chemical reaction involved. 10
 - (b) Discuss the factors affecting disinfection. State different methods of disinfection of water. 10

6.
 - (a) Explain the various factors which influence the selection of pumps for lifting water. 8
 - (b) Define the term optimum coagulant dose. Explain Jar Test. 6
 - (c) Discuss the various disposal and treatment methods of solid waste. 6

7. Write short notes on any **four** of the following :— 20
 - (a) Food chain and food web
 - (b) Distribution System
 - (c) Hazardous Waste
 - (d) 3 'R' of solid management
 - (e) Flash Mixer.