22504

23242

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following : **10**

(a) State different types of surface and sub-surface sources of water.

(b) State any two precautions required to be taken during water sampling.

(c) State the purpose of coagulation.

(d) Define disinfection. State its objects (any one).

(e) State any four types of pipes used for conveyance of water.

(f) Define Sewage, Sullage.

(g) State MPCB norms for discharge of treated sewage, for B.O.D. and Total solids.

2. Attempt any THREE of the following : **12**

(a) Draw a labelled sketch of river intake.

(b) State and explain four variations of demands of water.

(c) The population of city from census record, for last four decades is given in the following table. Calculate population at the end of year 2054 by incremental increase method :

Year	1994	2004	2014	2024
Population	1,09,000	1,19,000	1,26,000	1,38,000

(d) Compare plain sedimentation and sedimentation with coagulation.

3. Attempt any THREE of the following : **12**

(a) State methods of aeration. Explain any one method with neat sketch.

(b) Explain in brief the process of back washing in rapid sand filter.

(c) Draw a neat sketch of pressure relief valve and state its function.

(d) State different advanced water treatment methods. Explain any one.

4. Attempt any THREE of the following : **12**

(a) Describe break point chlorination with the help of graph.

(b) Describe grid iron system layout of distribution of water with suitable sketch.

(c) Explain bell and spigot joint with sketch.

(d) State different types of traps. Enlist quality of good trap.

(e) Draw layout of flow diagram of sewage treatment plant.

5. Attempt any TWO of the following : **12**

(a) Enlist six forms of chlorination with its application.

(b) Draw a neat and labelled sketch of drop manhole.

(c) Differentiate one pipe and two pipe system of plumbing.

6. Attempt any TWO of the following : **12**

(a) Draw a neat sketch of 'P', 'Q' and 'S' trap.

(b) Explain working of trickling filter with neat sketch.

(c) State various methods employed for disposal of sludge and explain any two.