22504

12223

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.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

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

(a) Define intake structure. Enlist different types of intakes.

(b) Enlist basic categories of water demand.

(c) Enlist different types of valves used in water supply pipeline network.

(d) Define : Self-cleansing velocity and non-scouring velocity.

(e) Define the terms – B.O.D. and C.O.D.

(f) Enlist different types of pipes used for water distribution purpose.

(g) Enlist any four Building sanitary fittings.

2. Attempt any THREE of the following : 12

(a) Explain the need for analysis of water to check its quality.

(b) The following data shows the variation in population of a town. Estimate the population of the town in 2031 using geometrical increase method :

Year	1951	1961	1971	1981	1991	2001
Population (Thousands)	82	95	120	154	194	231

(c) State the acceptable limits of drinking water for below listed parameters according to IS-10500 :

(i) MPN

(ii) Fluoride

(iii) Hardness

(iv) Chlorides

(d) Define : Disinfection and state its objects.

3. Attempt any THREE of the following : 12

(a) Explain reverse osmosis process with neat labelled sketch.

(b) State the principle of coagulation. Explain "Jar Test" with neat labelled sketch.

(c) Explain "Dead End System" layout of water distribution.

(d) Explain break point chlorination with neat labelled sketch.

4. Attempt any THREE of the following : 12

(a) Draw a neat labelled sketch of clariflocculator.

(b) Draw the neat labelled sketch of "combined system" method of distribution of water and explain its suitability.

(c) State the factors affecting selection of pipe materials. Mention types of pipe used specially for conveyance of hot water.

(d) State systems of sewerage and explain any one alongwith its advantages and disadvantages.

(e) State the parameters suggested by Maharashtra Pollution Control Board for sewage discharge with their limits.

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

(a) Explain the method of water softening and defluoridation technique for purification of water.

(b) Draw a neat labelled drainage plan for building related to sanitary fittings. State the principles regarding design of building drainage.

(c) Draw a neat labelled sketch of Drop Manhole. State any three criteria regarding spacing of manholes.

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

(a) Compare one pipe and two pipe systems of plumbing on any six points.

(b) Draw a neat labelled sketch of oxidation pond (plan & section) and explain its working.

(c) Draw a neat labelled sketch of septic tank (only c/s section) and state the functions of components.
