



22504

12223

3 Hours / 70 Marks

Seat No.

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- 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.
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