

17503

11718

3 Hours / 100 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. (A) Attempt any THREE of the following :

12

- (a) State four types of demand of water. State four factors affecting rate of demand.
- (b) State desirable limits as per IS for following parameters of drinking water :
 - (i) Colour
 - (ii) Turbidity
 - (iii) Total solids
 - (iv) Hardness
 - (v) Chlorides
 - (vi) Iron

[1 of 4]

P.T.O.

- (vii) pH value
- (viii) Flouride
- (c) State different forms of chlorination and give significance of residual chlorine.
- (d) State methods of aeration. Explain any one method with sketch.

(B) Attempt any ONE of the following :

6

- (a) Compare quality and quantity of water from surface source and sub-surface source.
- (b) State different Advanced Water Treatment methods. Explain any one method with neat sketch.

2. Attempt any FOUR of the following :

16

- (a) Draw layout of city water supply with rapid sand filter, label the parts and state the work carried out by each part.
- (b) What is the principle behind sedimentation with coagulation ? State any two types of coagulant.
- (c) Explain in brief the process of back washing in rapid sand filter.
- (d) What are valves ? Why are they required ? State two types of valves with their suitable locations.
- (e) Differentiate between one pipe and two pipe systems of plumbing.
- (f) Draw a typical layout of water supply arrangement for residential building indicating type of pipe material, sizes etc.

3. Attempt any FOUR of the following :**16**

- (a) Draw sketch of inspection chamber and give it's necessity.
- (b) Draw a labelled sketch of reservoir intake.
- (c) List the component parts of a drop manhole and state its necessity.
- (d) State measures for prevention of pollution of bores and well waters.
- (e) Describe 'water test' and 'air test' with reference to testing of sewers.

4. (A) Attempt any THREE of the following :**12**

- (a) List the operations carried out during periodical cleaning of drainage system.
- (b) Explain general principles of building drainage.
- (c) State function of (i) air relief valve, (ii) Non-return valve.
- (d) State norms for maintenance of domestic sanitary units.

(B) Attempt any ONE of the following :**6**

- (a) The following data is collected regarding population. Calculate demand of water for small residential area/colony and forecast the population of area in 2021 by geometrical increase method.

Year	1961	1971	1981	1991	2001
Population	4,320	5,200	7,120	8,000	9,150

- (b) State the reason for suitability of two pipe system over one pipe system.
Draw a neat labelled sketch of one pipe system partially ventilated.

P.T.O.

5. Attempt any FOUR of the following :**16**

- (a) Explain the procedure for laying of sewers.
- (b) Explain with neat sketch working of 'Trickling filter.
- (c) State role of Maharashtra Pollution Control Board in prevention of pollution.
- (d) Differentiate between (i) Aerobic and Anaerobic process, (ii) B.O.D. and C.O.D.
- (e) Draw the layout of sanitary plumbing and sewage collection of residential building.
- (f) Draw flow diagram of activated sludge process plant and explain its working.

6. Attempt any FOUR of the following :**16**

- (a) Write any two reasons for necessity of pre-treatment before trickling filter process in view of activated sludge process.
 - (b) Explain with neat sketch working of oxidation pond.
 - (c) Explain bell and spigot joint with sketch.
 - (d) Give importance of (i) Non-scouring velocity, (ii) Self cleansing velocity.
 - (e) List any four types of pipes used for conveyance of water and state the advantage of cast iron pipes.
-