

17503

16117

3 Hours / 100 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) Assume suitable data, if necessary.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.
(6) 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 the factors affecting rate of demand. (any four)
(b) Draw layout of water supply scheme.
(c) State the various methods of forecasting of population Explain any one.
(d) State the Necessity and Importance of Ground water recharging.
- (B) Attempt any **ONE** of the following : **6**
- (a) Describe Break point chlorination with the help of graph and state the importance of residual chlorine.
(b) State the factors governing the location of an intake structure.
2. Attempt any **FOUR** of the following : **16**
- (a) State the objects & methods of Aeration.
(b) Draw & label flow diagram of water treatment plant.

- (c) Define Disinfection. State its objects.
- (d) Describe the theory of filtration.
- (e) Differentiate between dead end system and grid iron system of distribution of water.
- (f) Explain construction and working of slow sand filter.

3. Attempt any FOUR of the following : 16

- (a) Draw a labelled sketch of clariflocculator.
- (b) Define coagulation and state purpose of using alum as coagulant.
- (c) Explain the process of prevention of pollution of bores and bore wells.
- (d) State the types and functions of distribution of water. (one function each)
- (e) Define chlorination & state its types.
- (f) State the necessity and importance of sanitation.

4. Attempt any FOUR of the following : 16

- (a) Define sewage and sullage.
- (b) Define trap and draw the sketch of any two types of Trap.
- (c) Draw the layout drainage plan for building sanitary fittings.
- (d) State the various system of plumbing. Explain any one.
- (e) State the types of sewers and mention purpose of each.
- (f) Define B.O.D. and state its significance in sewage treatment.

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

- (a) Describe the process of Sludge digestion.
- (b) Describe the working of septic tank with its L-Section.
- (c) Write the procedure of laying of sewer.
- (d) Draw a flow diagram of suitable sewage treatment process for Rural area.

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

(a) Describe rainwater and sewage collection system for residential building.

(b) Design a circular sewer using the following data :

Population = 30,000 souls

Rate of water supply – 135 lpcd

$N = 0.015$

Max Flow = $2 \times$ Average flow

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

(a) State the objects of sewage treatment.

(b) State the norms suggested by Maharashtra Pollution Control Board for the discharge of treated sewage. (any four)

(c) Draw the General layout and Flow diagram of sewage treatment plant.

(d) Explain the component parts of Manholes and Drop Manhole.

(e) Define Self Cleansing velocity, vent pipe, water closet & C.O.D.

(f) Explain the working of Trickling Filter with a neat sketch.
