

17503

16172

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

12

- (i) State the importance of public health Engineering.
- (ii) Define intake structure, state its types and explain any one.
- (iii) Enlist the objects and methods of aeration.
- (iv) What is jar test ? State its significance.

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

6

- (i) What is the need of analysis of water ? State the various tests on water.
- (ii) Define disinfection. Enlist its various methods and explain any one.

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

- (a) Define design period and state factors affecting on it.
- (b) Compare on any four points between slow sand filter and rapid sand filter.
- (c) Draw a neat sketch of classiflocculator.
- (d) State the location and function of the following pipe fittings :
 - (i) Air valve
 - (ii) Non-return valve
 - (iii) Scour valve
 - (iv) Foot valve
- (e) Enlist the qualities of good trap.
- (f) With the help of line diagram show arrangement of the sanitary plumbing for residential building.

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

- (a) Define sewage, sullage, effluent and garbage.
- (b) State the IS standards for drinking water for :
 - (i) pH
 - (ii) Turbidity
 - (iii) Total solids
 - (iv) MPN
- (c) Differentiate one pipe and two pipe systems of plumbing.
- (d) Draw a neat sketch of flow diagram of water treatment plant.
- (e) Define self-cleansing and non-scouring velocity.

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

- (i) Define the terms water pipe, soil pipe, sullage pipe, vent pipe.
- (ii) Draw a neat sketch of inspection chamber and label it.
- (iii) State the advantages and disadvantages of dead end system of distribution of water.
- (iv) Enlist the different methods of testing of sewers and explain any one.

(B) Attempt any ONE of the following : 6

- (i) Estimate the population at the end of year 2021 by incremental increase method :

Year	1971	1981	1991	2011
Population	79560	120320	160530	190670

- (ii) Draw a neat sketch of European type water closet.

5. Attempt any FOUR : 16

- (a) Explain any two steps in laying of sewers.
- (b) Define BOD. State its significance.
- (c) Differentiate aerobic and anaerobic process.
- (d) Explain activated sludge process with the help of neat sketch.
- (e) State the objects of sewage treatment.

6. Attempt any FOUR :**16**

- (a) Draw a flow diagram of sewage treatment plant.
 - (b) Explain the working of trickling filters with the help of neat sketch.
 - (c) Enlist the methods of distribution of water and explain any one.
 - (d) Draw a neat sketch of drop manhole.
 - (e) State the factors affecting the choice of pipe material for distribution of water.
 - (f) State norms for maintenance of domestic sanitary units.
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