

22504

11920

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.

Marks

1. Attempt any FIVE of the following :

10

- (a) Define :
 - (i) Forecasting of population
 - (ii) Intake structure
- (b) State any four factors affecting rate of demand of water.
- (c) Enlist any four types of valves provided in water supply scheme.
- (d) State any two advantages and disadvantages of dead end system.
- (e) Define trap. Sketch P-trap and S-trap.
- (f) Define : (i) sewage, (ii) garbage
- (g) State any four objects of sewage treatment.

2. Attempt any THREE of the following :**12**

- (a) Draw flow diagram of water treatment plant.
- (b) State the precautions to be taken for collection of sample of water.
- (c) The following is the population data for a town. Water supply scheme is to be designed for this town with a design period of 30 years. Find the population at the end of the year 2040 by incremental increase method.

Year	1970	1980	1990	2000	2010
Population	35,000	37,500	43,500	52,000	57,500

- (d) Define Aeration. State objectives of aeration.

3. Attempt any THREE of the following :**12**

- (a) Describe the principle behind sedimentation with coagulation.
- (b) Describe the theory of filtration.
- (c) Differentiate between gravity distribution system and pumping distribution system.
- (d) Describe the backwashing of rapid sand filter with neat labelled sketch.

4. Attempt any THREE of the following :**12**

- (a) State different forms of chlorination. Describe break point chlorination.
- (b) List any eight types of pipes used for conveyance of water.
- (c) Describe expansion joint with sketch.
- (d) Draw neat sketch of drop manhole.
- (e) Draw layout of sewage treatment plant.

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

- (a) Describe the process of coagulation. Explain the procedure of Jar test with neat labelled sketch.
- (b) Describe in detail, the procedure of laying of sewers.
- (c) Differentiate between one pipe plumbing and two pipe plumbing system with neat labelled sketch.

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

- (a) State the systems of sewerage. Describe separate system with merits and demerits.
 - (b) Differentiate between
 - (i) aerobic and anaerobic process
 - (ii) BOD and COD
 - (c) Describe working of trickling filter with neat sketch.
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