

314314

12526

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) 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. Attempt any FIVE of the following : **10**
- a) Define
    - i) Population forecasting
    - ii) Intake structure
  - b) State any two physical and chemical characteristics of water.
  - c) State the principle of sedimentation with coagulation.
  - d) State any four types of pipes used for conveyance of water.
  - e) Define trap. Sketch P-trap and S-trap.
  - f) Define : Self cleansing velocity and non-scouring velocity.
  - g) Enlist any four building sanitary fittings.

P.T.O.

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

- a) Draw flow diagram of water treatment plant.  
 b) Calculate the population at 2031 and 2041 using incremental increase method with following population census data.

Year	1991	2001	2011	2021
Population	9876	10865	11509	13852

- c) Explain break point chlorination with neat sketch.  
 d) State and explain four variation in demand of water.

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

- a) Differentiate between slow sand filter and rapid sand filter.  
 b) Describe grid iron system layout for distribution of water with suitable sketch.  
 c) State method of aeration. Explain any one method with neat sketch.  
 d) Define valve and enlist the different types of valve.

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

- a) Draw a neat sketch of drop manhole and label the following components –  
 i) Main sewer  
 ii) Branch sewer  
 iii) Benching  
 iv) Manhole cover  
 b) Explain the terms –  
 i) BOD  
 ii) COD  
 c) State the system of sewerage and explain any one along with its advantages and disadvantages.

- d) Draw a neat sketch of clariflocculator and label the following parts –
- i) Scraper arms
  - ii) Paddles
  - iii) Inlet and outlet
  - iv) Sludge outlet
- e) Explain bell and spigot joint with neat sketch.
- 5. Attempt any TWO of the following : 12**
- a) Differentiate between one pipe plumbing and two pipe plumbing system with neat sketch.
  - b) Explain the working of trickling filter with neat sketch.
  - c) Explain electrolysis and reverse osmosis treatment.
- 6. Attempt any TWO of the following : 12**
- a) Explain sludge digestion with neat sketch.
  - b) Draw a neat sketch of septic tank, state the function of components and label the following components.
    - i) Baffle wall
    - ii) Sludge
    - iii) Inlet
    - iv) Vent pipe
  - c) Describe the procedure for laying of sewers.
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