



17503

21415

3 Hours/100 Marks

Seat No.

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- Instructions :** (1) Answer **each** next main question on **a new page**.
(2) Illustrate your answers with **neat** sketches **wherever** necessary.
(3) Figures to the **right** indicate **full** marks.
(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.
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MARKS

1. A) Attempt **any three** of the following : **12**
- a) State four factors affecting rate of demand of water.
 - b) List different type of intake and explain any one.
 - c) What is the principle behind sedimentation with coagulation ? State any two types of coagulants.
 - d) Define filtration and state any four objects of filtration.
- B) Attempt **any one** of the following : **6**
- a) What is need for analysis of water ? Enlist various tests for potable water.
 - b) How can aeration improve water quality ? Explain method of aeration with sketch.
2. Attempt **any four** of the following : **16**
- a) Draw layout of water supply project. Label the parts and state the work carried out by each part.
 - b) Draw a labelled sketch of continuous flow type sedimentation tank.
 - c) Explain in brief the working process of rapid sand filter.
 - d) What are the different layouts for water distribution system ? Explain any one with neat sketch.
 - e) Draw p-trap and s-trap showing water seal.
 - f) Draw line diagram of sanitary plumbing and sewage collection of residential building.

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3. Attempt **any four** of the following : 16
- What is recycling of domestic waste ?
 - Draw a labelled sketch of canal intake structure.
 - Describe inspection chamber with neat sketch.
 - Compare on four points between rapid sand filter and slow sand filter.
 - State types of sewers. Describe any one.
4. A) Attempt **any three** of the following : 12
- State importance of building sanitation.
 - Draw neat sketch of European type water closet and explain in brief its working.
 - Sketch drop manhole showing its construction details.
 - Draw any four sections of sewer. State advantage of egg-shaped sewer.
- B) Attempt **any one** of following : 6
- The population of city from census record, for last four decades are given in the following table. Calculate population at the end of year 2041 by incremental increase method.
- | Year | 1981 | 1991 | 2001 | 2011 |
|------------|----------|----------|----------|----------|
| Population | 1,00,000 | 1,09,000 | 1,16,000 | 1,28,200 |
- Differentiate between one pipe and two pipe system of plumbing.
5. Attempt **any four** of the following : 16
- List any four sanitary pipe fitting and mention purpose of each.
 - Define COD. State its significance.
 - Differentiate between aerobic and anaerobic process.
 - Explain working of septic tank with sketch.
 - Enlist benefits of rain water harvesting.
 - Draw a general layout and flow diagram for sewage treatment plant.
6. Attempt **any four** of the following : 16
- Explain purpose of grit chamber. State its location.
 - Explain activated sludge process.
 - Draw a labelled sketch of trickling filters.
 - Describe the procedure of testing of sewers after construction is complete.
 - Enlist any four types of valves used in conveyance of water. State their location and one function of each.
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