17503

15116

3 Hours / 100 Marks Seat No. | | | | | | | | |

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.

(7) 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 any four factors affecting rate of demand. Explain any one in detail.

(b) Enlist four bacteriological tests need to be conducted on water.

(c) Define aeration. Enlist different methods of aeration.

(d) Define sedimentation. State different types of sedimentation tanks.

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

(a) Enlist six factors to be considered while selecting site for intake.

(b) Explain with neat sketch Jar Test.

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

(a) Draw flow diagram for water treatment plant. State one function of any four units.

(b) State the theory of filtration.

(c) Define the term “residual chlorine”. State its importance in disinfection.

(d) Enlist different types of valves used in water supply pipeline. Explain any one with respect to use, location and function.

(e) State different types of traps. Enlist four qualities of good trap.

(f) Enlist plumbing accessories required for plumbing of residential building.

P.T.O.

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

(a) Draw a neat labelled sketch of two pipe system of plumbing.

(b) State permissible limit for potable water (As per IS 10500 : 1991) for total solids, pH, Hardness, chlorides.

(c) Enlist four principles regarding design of building drainage.

(d) Draw neat labelled sketch of 'pressure filter'.

(e) Define – (i) Self-Cleaning velocity

(ii) Non-Scouring velocity

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

(a) Explain 'inspection chamber' with respect to necessity, location, size and shape.

(b) Draw layout plan for building sanitary fittings for a residential building.

(c) Enlist various methods of distribution systems of water. State any two advantages and disadvantages of any one method.

(d) Draw a neat labelled sketch of drop manhole.

(B) Attempt any ONE of the following : **06**

(a) From the following census data calculate probable population in the year 1970, 1980, 1990 :

Year	1930	1940	1950	1960
Population	10,000	14,000	19,000	25,000

Use Geometrical increase method.

(b) Define soil pipe, vent pipe, sullage, waste pipe.

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

(a) Design circular sewer using following data :

Population – 40,000

Total water supplied = 300 lpcd

Sewage to be carried = 80%

Velocity = 1 m/s

(b) Enlist any four units of sewage treatment plant. State function of each.

(c) Explain oxidation pond.

(d) State MPCB norms for discharge of treated sewage.

(e) Explain the concept of rainwater harvesting with respect to necessity and methods.

(f) Explain ‘Activated Sludge Process’.

6. Attempt any FOUR of the following : 16

(a) Draw general layout and flow diagram of sewage treatment plant.

(b) Define ‘BOD’ and ‘COD’. State its significance in treatment of sewage.

(c) Enlist different methods of layout of distribution of water. Explain any one in detail.

(d) Explain in brief testing and maintenance of sewers.

(e) Enlist various pipe materials used for conveyance of water.

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