21718

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) Draw flow diagram of water supply scheme from source to consumer.

(b) Enlist types of pipes. State the factors affecting selection of pipe material.

(c) State any four qualities of good trap.

(d) Write step-by-step procedure of laying of sewers.

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

(a) Compare any six points between Rapid sand filter & Slow sand filter.

(b) State the permissible limits as per I.S. for following parameters of drinking water :

(i) Colour (ii) Hardness (iii) pH

(iv) Turbidity (v) Chloride (vi) Temperature

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

(a) Enlist different methods of Aeration. Explain any one of them with neat sketch.

(b) Explain purpose of Grit Chamber. State its location.

(c) Explain Grid iron system of water distribution with neat sketch.

(d) Enlist different types of sewer according to shape. Explain any one of them.

(e) Draw a neat labelled sketch of 'Q' and 'S' trap.

(f) State the importance of building sanitation.

3. Attempt any FOUR of the following : **4 × 4 = 16**

(a) Enlist different types of Intakes. Explain any one with neat sketch.

(b) Differentiate between one pipe and two pipe system of plumbing.

(c) Explain construction and working of Standard rate trickling filter. Also state its advantages & disadvantages.

(d) State any four factors affecting demand of water.

(e) What is water conservation ? State the necessity of ground water recharging.

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

(a) Draw a neat sketch of clariflocculator.

(b) Enlist flushing cisterns. Explain any one of them.

(c) State systems of sewerage and describe any one.

(d) Differentiate between aerobic & anaerobic process.

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

(a) 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 year 2041 by Incremental increase method; also calculate total demand of water.

Year	1971	1981	1991	2001	2011
Population	39701	50157	68107	93351	115307

(b) Explain working of septic tank with neat sketch.

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

(a) Explain zeolite process of water softening.

(b) State the location and function of the following pipe fittings :

(i) Air Valve

(ii) Reflux Valve

(iii) Scour Valve

(iv) Sluice Valve

(c) Draw sectional elevation of 'Drop Manhole'. Label the parts & state its location.

(d) Define B.O.D. State its significance in sewage treatment.

(e) Enlist methods of distribution of water. Explain any one of them.

(f) Draw the layout of sanitary plumbing and sewage collection of residential building.

P.T.O.

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

(a) Enlist four forms of chlorination. Explain break point chlorination with graph.

(b) State necessity of inspection & junction chamber with its location.

(c) Explain working of oxidation pond with neat sketch.

(d) State the preventive measures to avoid pollution of bores & wells.

(e) State significance of rain water harvesting. Explain any one method of it.
