



Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, June 2018
(2008 Scheme)**

08.704 : ENVIRONMENTAL ENGINEERING – I (C)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. a) Describe briefly the method of collecting samples of water from different sources for its physical and chemical examinations. What special precautions will be required to be observed of biological examination is also to be conducted ?
- b) What is meant by the variations in the rate of demand ? What are the effects of these variations on the design of various units of a water supply scheme ?
- c) Differentiate slow sand filter and rapid sand filter with reference to
 - i) Rate of filtration
 - ii) Filter media of sand
 - iii) Depth of bed for gravel and sand
 - iv) Area
 - v) Efficiency.
- d) Find the settling velocity of a discrete particle in water under conditions when Reynold's number is less than 0.5. The diameter and specific gravity of the particle is 5×10^{-3} cm and 2.65, water temperature is 20°C , kinematic viscosity of water at $20^\circ\text{C} = 1.01 \times 10^{-2}$ cm²/sec.
- e) Differentiate fluoridation and defluoridation.
- f) What are the requirements of a good distribution system ?
- g) Define :
 - i) Adsorption
 - ii) Aeration.
- h) According to Indian standards for water quality for drinking purpose, what are the suggested value of nitrate, pH, Hardness, chloride and dissolved oxygen.

(8×5=40 Marks)

P.T.O.



PART – B

Module – I

2. a) In a town it has been decided to provide 200 litres per head per day in the 21st century. Estimate the domestic water requirement of this town in the year 2000 by projecting the population of the town by incremental increase method. 10

Year	1940	1950	1960	1970	1980
Population	23798624	46978325	54786437	63467823	69077421

- b) Explain logistic curve method of population forecasting. 10

OR

3. Explain the physical and chemical characteristics of water. 20

Module – II

4. a) Design a rectangular sedimentation tank to treat 2 million litres of water per day. The detention period may be assumed as 3 hours and over flow rate as 40,000 litres/m² of the surface area per day (with a neat sketch). 12
- b) What is coagulation ? Explain the theory of coagulation. 8

OR

5. a) With a neat sketch explain the working of a rapid sand filter. 14
- b) Determine the quantity of alum required in order to treat 15 million litres of water per day at a treatment plant, where 12 ppm of alum dose is required. Also determine the amount of carbondioxide gas which will be released per litre of water treated. 6



Module – III

6. a) A pipe network consists of the following pipes.

Pipe	Length (m)	Diameter (cm)
AB	400	30
BC	600	30
AD	500	40
DC	500	25

Inflow at A is $1\text{m}^3/\text{sec}$, while outflows at B, C and D are 0.3, 0.5 and $0.2\text{m}^3/\text{sec}$ respectively. Find the flow in each pipe taking only one trial by Hardy cross method.

12

b) Explain the different layouts of distribution network.

8

OR

7. a) Explain the disinfecting action of chlorine with water.

7

b) What is breakpoint chlorination ? What are the advantages of breakpoint chlorination ?

7

c) Write short note on colour, taste and odour removal.

6
