

5E5062

Roll No. \_\_\_\_\_

Total No of Pages: **4**

**5E5062**

**B. Tech V Sem. (Main/Back) Exam. Nov-Dec. 2015**

**Civil Engineering**

**5CE2A Environmental Engineering-I**

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks Main: 26**

**Min. Passing Marks Back: 24**

*Instructions to Candidates:*

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. NIL

2. NIL

**UNIT-I**

Q.1 (a) What do you mean by the term "per-capita demand"? How is it estimated? What are the factors which affect per capita demand? [8]

(b) What is population forecasting? Discuss various methods used for this purpose with their merits and demerits. [8]

**OR**

Q.1 (a) Explain different types of water demands. How are they estimated? [8]

(b) What do you understand by design period? Describe the factors which govern design period? What are the values of design period as per the manual on water supply for the following components: - [8]

- (i) Pump hones.
- (ii) Water Treatment Plant.
- (iii) Reservoirs.
- (iv) Distribution System.

**UNIT-II**

Q.2 (a) What are the common sources of water for a water supply scheme? Explain the method of finding the yield of ground water. [8]

(b) What are the permissible limits of the following for public drinking water as per the Indian Standards: - [8]

- (i) Turbidity
- (ii) Colour
- (iii) Hardness
- (iv) pH
- (v) Chloride
- (vi) Nitrate
- (vii) Total dissolved Solids
- (viii) Alkalinity

**OR**

Q.2 (a) What is meant by porosity and permeability? How do they affect the ground water storage? [8]

(b) Explain the following terms: - [8]

- (i) B. coli.
- (ii) M. P. N.
- (iii) Water borne diseases.
- (iv) Physical characteristics of water.

UNIT-III

- Q.3 (a) Water has to be supplied to a town with one lakh population at the rate of 150 litres per capita per day from a source, 1.8 km away. Determine the size of the supply main assuming suitable data where necessary. Also find head loss using Hazen- William's formula. [10]
- (b) Explain the sedimentation process with a neat sketch of a plain sedimentation tank. [6]

OR

- Q.3 (a) Estimate the hydraulic gradient in a 2 m dia smooth concrete pipe carrying a discharge of 3 cumecs at 10°C temperature, by using Davey- Weisbach formula. Assume dimensionless friction factor  $f' = 0.011$  [10]
- (b) What do you mean by sedimentation aided with coagulation? Explain the laboratory method to find out the optimum quantity of coagulant. [6]

UNIT-IV

- Q.4 (a) What are the differences between slow sand filters and rapid gravity filters? Explain in detail. [8]
- (b) Explain the following terms:- [8]
- (i) Pre- chlorination.
  - (ii) Break- point chlorination.
  - (iii) Super- chlorination.
  - (iv) Double chlorination.

OR

- Q.4 (a) What are the differences between lime-soda process and zeolite process? Explain in detail. [8]
- (b) What is meant by disinfection of water? What is its importance? Explain the different methods used for this purpose. [8]

**UNIT-V**

Q.5 Write short notes on the following (any four):- [4×4=16]

- (a) Hardy- Cross Method.
- (b) Components of House water connection.
- (c) Fire hydrants.
- (d) Distribution reservoirs.
- (e) Stand Pipes.

**OR**

Q.5 What do you mean by layout of distribution system? Illustrate with sketches the different types of layouts of pipe system in distributing water. Compare them with their merits and demerits. [16]