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10CV61

**Sixth Semester B.E. Degree Examination, June/July 2017**  
**Environmental Engineering - I**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.**

**PART - A**

- 1 a. Explain the need for protected water supply system for a city or town. (04 Marks)  
b. What is rate of demand? Explain any six factors affecting the rate of demand. (08 Marks)  
c. What is Population forecasting? List any six methods of population forecasting. Explain the graphical method in detail, with a sketch. (08 Marks)
- 2 a. Define design period and explain any four factors governing the design period. (06 Marks)  
b. Forecast the population of a city by 2030 whose census record is as follows using  
i) Geometrical increase method and ii) Incremental increase method. (14 Marks)
- |                         |      |      |      |      |
|-------------------------|------|------|------|------|
| Year :                  | 1970 | 1980 | 1990 | 2000 |
| Population in thousands | 160  | 169  | 180  | 195  |
- 3 a. Explain the following sources of water with respect to quantity and quality :  
i) Open well ii) River. (06 Marks)  
b. What are Intake structures? List the different types of intakes and explain any one, with a neat sketch. (08 Marks)  
c. Define Optimum dosage of co-agulant and explain the Jar test in detail. (06 Marks)
- 4 a. Give the permissible limit and effects of following impurities in drinking water :  
i) Fluorides ii) Chlorides iii) Nitrites iv) Iron. (08 Marks)  
b. Give the four objectives of water analysis. (04 Marks)  
c. What is Aeration of water? What are its objectives? List the different types of aerators. (08 Marks)

**PART - B**

- 5 a. Explain with a neat sketch the working of a horizontal type pressure filter. (06 Marks)  
b. Compare Slow Sand Filter (SSF) with Rapid Sand Filter (RSF) for the following parameters  
i) Rate of filtration ii) Method of cleaning iii) Maximum size of each unit  
iv) Bacterial removal efficiency v) Filter media sand. (10 Marks)  
c. Explain i) Uniformity co-efficient (UC) ii) Air binding. (04 Marks)
- 6 a. Give any three i) Mechanism of disinfection and ii) Requirements of good disinfectant. (06 Marks)  
b. Explain i) Pre chlorination and Plain chlorination ii) Super chlorination and Dechlorination. (04 Marks)  
c. What is Softening of water? Explain in detail lime - soda method of softening with advantages and disadvantages. (10 Marks)
- 7 a. How do you arrive the capacity required for a service reservoir? Explain. (04 Marks)  
b. What is Defluoridation? Explain any two methods of defluoridation. (08 Marks)  
c. List the different methods of layout of distribution system. Explain any one method with its merits and demerits. (08 Marks)
- 8 a. What are Pipe appurtenances? List them. (04 Marks)  
b. With a neat sketch, explain i) Post type fire hydrant ii) Reflux valve. (10 Marks)  
c. Explain the use of following chemicals in water treatment : i) Activated carbon  
ii) Copper sulphate iii) Bleaching powder iv) Alum v) Zeolites vi) Sodium hypo chlorite. (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.