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B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Fifth Semester
Civil Engineering
CE 6503 – ENVIRONMENTAL ENGINEERING – I
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. State any two objectives of public water supply system.
2. What do you mean by design period ?
3. State the advantages of DI pipe.
4. Mention any two appurtenances in water conveyance system.
5. What role does flash mixer play in water treatment plant ?
6. Enumerate any two mechanisms of disinfection process.
7. What do you mean by physical adsorption ?
8. Name any two water softening process.
9. List out the components of house service connection.
10. State any two requirements of good distribution system.

PART – B (5×13=65 Marks)

11. a) The population of a town as per census record is furnished below. Forecast the population in the year 2031 and 2041 using the following methods :
    i) Arithmetical increase method
    ii) Geometrical increase method
    iii) Incremental increase method.

Census year	1931	1941	1951	1961	1971	1981	1991	2001	2011
Population	21300	36650	48485	55518	65356	79890	95543	110560	129410

(OR)

b) Enumerate and explain the characteristics of water and state their environmental significance.

12. a) i) What are the important considerations which govern the selection of site of an intake structure ? (8)
    ii) Explain the salient features of a canal intake with the aid of a neat sketch. (5)

(OR)

b) Describe the various pipe materials used in conveyance of water.

13. a) Estimate the alum and quick lime requirements with reactions involved to treat 100 MLD of water with raw water alkalinity of 9 mg/L as $CaCO_3$ if the alum dosage adopted was 40 mg/L.

(OR)

b) Explain the chlorine chemistry with the aid of suitable chemical equations and outline various forms of chlorination.

14. a) Explain the working principle of demineralization plant with a neat sketch.

(OR)

b) Enumerate and explain the various methods of removal of iron and manganese from groundwater.

15. a) Discuss with neat sketches the various types of layout of distribution system and brief the advantages and disadvantages of each system.

(OR)

b) i) What is a service reservoir ? Give its importance in a distribution system. (8)
    ii) How is the capacity of a distribution reservoir determined ? (5)

PART – C (1×15=15 Marks)

16. a) A new township is to have a population of 3,50,000 and 90 Lpcd of water supply. Design a rapid sand filter unit with details of under drainage and water washing including gutter arrangement. Limit the maximum spent backwash water as 3.5%.

(OR)

b) Find the flow in each pipe in the Loop shown in Fig.1. Use Hardy Cross method for analyzing the Loop. Consider C_H as 100 for all pipes.

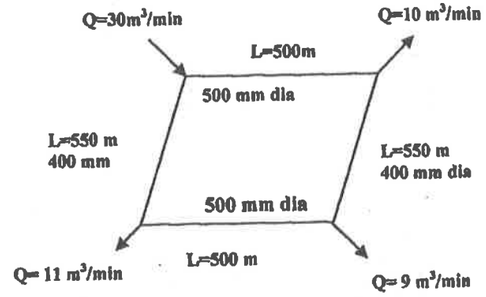

Fig. 1