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Question Paper Code : L 20305

B.E./B.Tech. DEGREE EXAMINATIONS, NOV./DEC. 2020

Fifth Semester

Civil Engineering

CE 6503 – ENVIRONMENTAL ENGINEERING – I

(Also common to PTCE 6503 – Environmental Engineering – I for

B.E. (Part-Time) Third Semester – Civil Engineering – Regulations – 2014)

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. List out the components of a public water supply system.
2. What is meant by design period ?
3. Draw any two line diagrams of joints in pipe lines.
4. How will you calculate total head in the design of pumps for water supply schemes ?
5. What is known as schmutzdecke or dirty skin ?
6. Define alkalinity and fluoridation.
7. What are the methods for Deflouridation ?
8. How to remove iron from water ?
9. What are the methods available to find the leakages in pipe line ?
10. Where the ring system of water distribution system is a adopted ?

PART – B

(5×13=65 Marks)

11. a) i) List and explain various factors affecting per capita demand of water. (7)
 ii) Write a short note on impurities present in water based on its physical characteristics. (6)

(OR)

- b) i) Explain the importance and necessity of planned water supply. (6)
 ii) Explain geometrical increase and incremental increase methods of population forecast with some example count. (7)

12. a) i) What are the important considerations ? Which govern the selection of site of an intake ? (6)
 ii) Discuss the factors to be considered in the selection of pipe material for water transmission. (7)

(OR)

- b) A centrifugal pump with the following characteristics is installed in a system to raise water from one reservoir to another. The water surface elevation in the first reservoir is 150 m and that in the second reservoir is 200 m. The pipeline connecting the reservoir is 3 km of 300 mm diameter. Determine the operating point in the system. Take $C_H = 110$. Also compute WHP and BHP of the pump assuming pump efficiency of 70%.

Pump discharge, Lpm	:	0	650	1400	2150	3000	3650
Total dynamic head, m	:	63.0	60.5	56.0	49.5	36.5	21.0

13. a) Design a coagulant sedimentation tank to treat 8 million liters of water per day. Assume suitable data where its necessary.

(OR)

- b) Explain about slow sand filter and rapid sand filter with suitable diagram and also write their advantages over them.

14. a) Explain the different methods of water softening.

(OR)

- b) Write a note on :
 i) Prasanthi techniques. (4)
 ii) Reverse osmosis. (4)
 iii) Nalgonda technique. (5)

15. a) i) Explain the Hardy-Cross method of distribution network analysis. (7)

ii) Write short notes on the detection and prevention of wastage of water. (6)

(OR)

b) Discuss the various possible water distribution arrangements in multi-storaged buildings.

PART – C

(1×15=15 Marks)

16. a) Briefly discuss about the various physic-chemical test on water and write their limitation for domestic and industrial purpose.

(OR)

b) Design the rapid gravity sand filter for a flow of 20 MLD. Assume suitable design parameters.
