USN ☐☐☐☐☐☐☐☐☐☐   **18CV46**

Fourth Semester B.E. Degree Examination, Jan./Feb. 2023
Water Supply and Treatment Engineering

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a.   Discuss the points to be considered for a public water supply scheme.   **(10 Marks)**
    b.   Estimate the population by 2021 by Arithmetic and geometric progression method using following census data and discuss which method in ideal and why?

Year	1971	1981	1991	2001
Population	19800	42000	75000	110000

                                                        (10 Marks)

OR

2   a.   What is design period? Discuss the factors governing the design period and list design period for different components of a water supply scheme.   **(10 Marks)**
    b.   What is Fire demand? Discuss the various empiral formulas for fire demand.   **(10 Marks)**

Module-2

3   a.   What are the objectives of water treatment? List out the impurities removed in each operation/process in water treatment plant.   **(10 Marks)**
    b.   What are Intake Structures? Discuss the points to be considered for a site selection of Intake structure   **(10 Marks)**

OR

4   a.   What is sampling? Discuss the methods and preservation technique.   **(10 Marks)**
    b.   What is aeration? Explain various methods of aeration.   **(10 Marks)**

Module-3

5   a.   What are coagulants? Explain how to determine the optimum coagulants dosage using Jar test apparatus.   **(10 Marks)**
    b.   Explain mechanism of filtration.   **(10 Marks)**

OR

6   a.   Design a sedimentation tank for a water works which supplies 1.5×10^6 litres /day. Velocity of flow is 15cm/min and depth of water in tank is 3.5m. Sedimentation period in 5 hours. Assume an allowance for sludge as 50cm.   **(10 Marks)**
    b.   With neat sketch explain backwashing in Rapid sand filters. Also list out the operation problems in Rapid sand filters.   **(10 Marks)**

Module-4

7   a.   Explain Lime Soda process for removal of hardness with chemical reaction with advantages and disadvantages.   **(10 Marks)**
    b.   Explain the Forms of chlorination.   **(10 Marks)**

OR

8   a.   Briefly explain Importance of Fluoridation and Defluoridation. With neat sketch explain Nalagonda Technique.   (10 Marks)

      b.   Enumerate the merits and demerits of RO and Nano filtration process.   (10 Marks)

Module-5

9   a.   List the various layouts used is water distribution networks. Discuss in detail any two methods with neat sketch.   (10 Marks)

      b.   With neat sketch explain :
      (i) Fire hydrant   (ii) Water meter.   (10 Marks)

OR

10   a.   List different pipe materials used in water supply. Discuss the advantages and disadvantages of any two pipe materials.   (10 Marks)

      b.   Water has to be supplied to a town with one lakh population at a rate of 150 LPCD from a river 2000m away. The difference in elevation between the lowest water level in the sump and the reservoir is 36m. If the demand has to be supplied in 8 hours, determine the size of the main and the brake horse power of the pumps required. Assume maximum demand as 1.5 times the average demand. Assume f = 0.0075. Velocity in the pipe 2.4 m/sec and efficiency of pump 80%.   (10 Marks)

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