Reg. No.

B.E. / B.TECH. DEGREE EXAMINATION, MAY 2023

Fifth Semester

CE18504 – WATER SUPPLY ENGINEERING

(Civil Engineering)

(Regulation 2018)

TIME: 3 HOURS   **MAX. MARKS: 100**

CO1	To determine the population for the design period and water demand and describe the various sources and characteristics of water.
CO2	To determine the sizes of different types of intake structure and conveyance system for water transmission.
CO3	To describe the process of conventional treatment of water and compute the sizes of the conventional water treatment units.
CO4	To explain the various processes of advanced water treatment and calculate the sizes of various advanced treatment systems.
CO5	To determine the capacity of service reservoir, analyse the water distribution networks and classify the different systems of water supply in buildings.

PART- A (10 x 2 = 20Marks)

(Answer all Questions)

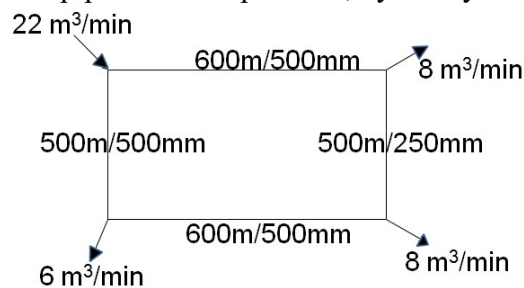|		CO	RBT LEVEL
1.	What are the different types of springs?	1	2
2.	Name the drinking quality standards for any four physic-chemical parameters.	1	2
3.	How do you select pipe material for water supply scheme?	2	2
4.	Mention the basis for the selection of a particular type of pump for water supply.	2	2
5.	Give the design criteria for flash mixer and flocculator.	3	2
6.	How to manage the residue in water treatment plant?	3	2
7.	Describe the process of Activated carbon adsorption.	4	2
8.	Explain the principle of Electrodialysis.	4	2
9.	Mention the important components needed for the water distribution system.	5	2
10.	What are the prime functions of service reservoirs?	5	2

PART- B (5x 14=70Marks)

		Marks	CO	RBT LEVEL
11. (a)	Determine the future population of a city by Arithmetic increase method and Geometrical increase method for the year 2031 with the following data.	(14)	1	3

Year	1961	1971	1981	1991	2001	2011
Population	858545	1015672	1201553	1691538	2077820	2585862

(OR)

(b)	Briefly discuss about the various physicochemical characteristics of water and write their limitation for domestic purpose.	**(14)**	**1**	**3**
12. (a)	Describe the various pipe joints with neat sketches.	**(14)**	**2**	**3**

(OR)

(b)	Design a bell mouth canal intake for a city of 75,000 persons, drawing water from a canal which runs only for 10 hours a day with a depth of 1.5m. Also calculate the head loss in the intake conduit if the treatment works are ¼ km away. Given average consumption per person = 150 l/d. Assume the velocity through the screens and bell mouth to be less than 16 cm/s and 32 cm/s, respectively.	**(14)**	**2**	**3**
13. (a)	Design a clariflocculator with continues flow for a population of 60000 people with a daily per capita water demand of 120 litres. Make suitable assumption, if needed.	**(14)**	**3**	**3**

(OR)

(b)	Explain the mechanism of sand filtration. Draw a neat sketch of slow sand filter unit and explain the working principle.	**(14)**	**3**	**3**
14. (a)	Describe the types of hardness present in water and discuss about the ion exchange method of water softening with a sketch.	**(14)**	**4**	**3**

(OR)

(b)	Describe in detail about the principle, mechanism and methods of desalination process.	**(14)**	**4**	**3**
15. (a)	Explain with neat sketches the various types of layout of distribution system and state their advantages and disadvantages.	**(14)**	**5**	**3**

(OR)

(b)	Find the flow in each pipe in the loop shown, by Hardy-Cross method.	**(14)**	**5**	**3**

PART- C(1x 10=10Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Explain the various water demands to be fulfilled during the design of water supply scheme and also explain the fluctuations in the rate of demand.	**(10)**	**1**	**5**