Total No. of Questions : 4]

SEAT No. :

P8861

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Oct-22/TE/Insem-516

T.E. (Civil Engineering)

WATER SUPPLY ENGINEERING

(2019 Pattern) (Semester - I) (301002)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates :

1) ***Solve Q.1 or Q.2, Q.3 or Q.4.***
2) ***Each question carries equal marks.***
3) ***Figures to the right indicates full marks.***
4) ***Use of calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Using the data given below, find the population for the year 2020 using i) Arithmetic Increase method. ii) Geometrical Increase Method. **[6]**

Year	1950	1960	1970	1980	1990	2000
Population (Thousand)	65	68	72	79	89	97

b) Enlist various physical, Chemical and biological characteristics of water. **[3]**

c) Enlist various units of water treatment plant. Also mention functions of each treatment unit. **[6]**

OR

Q2) a) Find out water demand of a town in the year 2041 by Incremental Increase method from the following census data : **[6]**

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

b) State types of Aerators and list out the objectives of aeration. **[4]**

c) What is principle of sedimentation? Enlist the various factors affecting sedimentation. **[5]**

Q3) Design a cascade type circular aerator with following data : **[6]**

a) i) quantity of water flowing over aerator per day is 150 MLD.

ii) loading rate is 0.03 m $m^2/m^3/hr$

iii) velocity of flow in collecting channel 1m/s

b) The average daily demand at a town has been estimated as 8 million liters per day. Design a suitable sedimentation, tank assuming a detention period of 5 hours and velocity of flow as 22cm per minute. **[5]**

c) Write a short note on: Tube settlers **[4]**

OR

Q4) a) A circular sedimentation tank fitted with mechanical sludge removal unit is to treat 4.0 million litres of water per day. The detention period of the tank is 5 hours. If the depth of the tank is to be restricted to 3 m, calculate the diameter of the tank. **[6]**

b) Explain the various types of settling of particles in sedimentation tank. **[4]**

c) Draw and explain treatment flow sheet of surface water. **[5]**