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SEAT No. :

PC16

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[6360]-16

B.E. (Civil) (Insem)

WATER SUPPLY ENGINEERING

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

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

Instructions to the candidates:

1) ***Solve Q1 or Q2, Q3 or Q4.***
2) ***Figures to the right indicate full marks.***
3) ***Draw neat figures wherever necessary.***

Q1) a) Explain necessity and importance of water supply scheme. **[4]**

b) Census data for a town is as follows. **[6]**

Year	1971	1981	1991	2001	2011
Population	35000	37500	43500	52000	57500

Estimate the population in the year 2030 by geometric increase method.

c) Mention any two chemical and biological tests for water along with the unit of measurement. **[5]**

OR

Q2) a) Define design period. State design period for various components of water supply scheme. **[4]**

b) Census data for a town is as follows. **[6]**

Year	1971	1981	1991	2001	2011
Population	35000	37500	43500	52000	57500

Estimate the population in the year 2030 by incremental increase method.

c) State the HDL and MPL values as per IS:10500 for drinking water with appropriate unit, for pH, Alkalinity, Chlorides and Nitrates. **[5]**

P.T.O.

Q3) a) Differentiate between water treatment operations and processes along with examples. **[4]**

b) The maximum daily demand of water for a town is 15 MLD. Design a 04 steps cascade aerator considering loading rate as 0.03 $m^2/m^3/hr$. Assume velocity of flow in collecting channel is 0.6 m/sec and height of aerator is 2.4 m. **[6]**

c) A water treatment plant has four clarifiers treating 0.18 m^3/s of water. Each clarifier is 5 m wide, 25 m long, and 4.6 m deep. Determine: **[5]**

i) the detention time

ii) overflow rate

iii) horizontal velocity and

iv) weir loading rate assuming the weir length is 2.5 times the basin width.

OR

Q4) a) Mention various objectives of aeration. Also discuss various limitations of aeration. **[4]**

b) The maximum daily demand of water for a town is 150 MLD. Design 06 steps cascade aerator considering loading rate as 0.03 $m^2/m^3/hr$. Assume velocity of flow in collecting channel is 1m/sec and height of aerator is 3 m. **[6]**

c) The maximum daily demand of water is 6 MLD. Design a plain sedimentation tank rectangular in shape, assuming the detention time of 4 hours and flow through velocity of 20 cm/minute. Also check the flow rate. **[5]**