

# C.U.SHAH UNIVERSITY

## Summer Examination-2018

**Subject Name :** Water and Wastewater Engineering

**Subject Code :** 4TE06WWE1      **Branch :** B.Tech (Civil)

**Semester :** 6    **Date :** 04/05/2018    **Time :** 02:30 To 05:30    **Marks :** 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

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<b>Q-1</b>	<b>Attempt the following questions:</b>	<b>(14)</b>
a)	What is Buston's empirical formula to estimate quantity of water required for firefighting?	01
b)	What is design period of a water supply project?	01
c)	What is an intake structure?	01
d)	What is Hazen William's formula used to determine head loss due to friction in the pipe?	01
e)	Define detention period.	01
f)	What is disinfection?	01
g)	What is sterilization?	01
h)	Enlist various factors affecting variations in sewage flow.	01
i)	Enlist various factors affecting DWF.	01
j)	What is timbering of trenches?	01
k)	Enlist various tests which are required for sewer lines before they are put into service.	01
l)	What is unit operations and unit processes?	01
m)	What are main objectives of grit chamber?	01
n)	Define hydraulic retention time.	01

**Attempt any four questions from Q-2 to Q-8**

<b>Q-2</b>	<b>Attempt all questions</b>	<b>(14)</b>
(a)	Write short note on reservoir intake.	05
(b)	Describe the factors governing the location of an intake structure.	05
(c)	A 1 m diameter smooth concrete pipe carries a discharge of 0.9 cumecs at an average temperature of 20°C. Compute the hydraulic gradient using Darcy-Weisbach formula. Assume suitable data if required.	04
<b>Q-3</b>	<b>Attempt all questions</b>	<b>(14)</b>
(a)	Explain clariflocculator.	05
(b)	Write short note on rotating biological contractors (RBC).	05



- (c) What is necessity of using coagulants in sedimentation? **04**
- Q-4 Attempt all questions (14)**
- (a) Discuss “Septic tank – A low cost sanitation system.” **05**
- (b) What are the advantages and disadvantages of coagulation? **05**
- (c) Differentiate between activated sludge process and trickling filter process. **04**
- Q-5 Attempt all questions (14)**
- (a) Enlist the population forecasting methods and describe geometrical increase method and incremental increase method. **07**
- (b) In a town it has been decided to provide 200 litres per head per day in the 21<sup>st</sup> century. Estimate the domestic water requirements of this town in the year 2020 AD by projecting the population of the town by the incremental increase method, from the data given below: **07**

Year	Population
1960	2,50,000
1970	4,80,500
1980	5,50,300
1990	6,38,600
2000	6,95,200

- Q-6 Attempt all questions (14)**
- (a) What is per capita demand? Describe various factors affecting per capita demand of water. **07**
- (b) What do you mean by variation in flow of sewage? Explain average flow, dry weather flow and maximum flow. **07**
- Q-7 Attempt all questions (14)**
- (a) Explain with neat sketch working of a rapid sand filter. **07**
- (b) How will you decide storage capacity of ESR? **07**
- Q-8 Attempt all questions (14)**
- (a) What are the requirements of an ideal distribution system? Describe in brief various types of distribution systems. **07**
- (b) Design a sewer to carry a waste water discharge of 0.25 m<sup>3</sup>/sec with a slope 1 in 50. **07**

