

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name : Water and Wastewater Engineering

Subject Code : 4TE06WWE1

Branch: B. Tech. (Civil)

Semester : 6

Date : 17/05/2016

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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- Q-1 Attempt the following questions: (14)**
- a) Under normal conditions, the average domestic consumption in India per person per day in liters is 1
(A) 105 (B) 135 (C) 180 (D) 215
- b) The water of a river has an important property called 1
(A) Turbidity (B) Self –purification (C) Permeability (D) Infiltration capacity
- c) The turbidity of water is caused due to 1
(A) clay (B) Silt (C) finely divided organic material (D) all the above
- d) Non-carbonate hardness of water is mainly due to 1
(A) silicates (B) aldehydes
(C) nitrates and sulphates (D) sulphates and chlorides
- e) The devices installed for drawing water from the sources are called 1
(A) filter (B) intakes (C) aquifers (D) none of the above
- f) The void spaces in the filtering material act like 1
(A) Drain (B) inlet (C) tiny settling basins (D) outlet
- g) Alum increases 1
(A) hardness of water (B) carbonates in water
(C) sulphates in water (D) acidity of water
- h) The waste water from bath rooms, kitchen etc. is called 1
(A) refuse (B) sullage (C) sewage (D) garbage
- i) The bacteria which live on free oxygen of air or on the oxygen dissolved in water are called 1
(A) aerobic bacteria (B) anaerobic bacteria
(C) facultative bacteria (D) all the above are correct
- j) The liquid waste conveyed by a sewer is known as 1
(A) sewer (B) sewerage (C) sewage (D) all the above are correct



- k) A manhole incorporating a vertical shaft or pipe in which sewage falls from a sewer at a higher level to a sewer at a lower level is called 1
 (A) deep manhole (B) bottom manhole (C) pit manhole (D) drop manhole
- l) Trickling filters are used to remove 1
 (A) suspended solids (B) colloidal solids
 (C) organic matter (D) pathogenic bacteria
- m) Which one of the following sewage treatment units has a parshall flume ? 1
 (A) trickling filter (B) oxidation ditch (C) grit chamber (D) aerated lagoon
- n) pH value of drinking water should be in the range 1
 (A) 1 to 10 (B) 2 to 6 (C) 6.5 to 8.5 (D) 8.5 to 10

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

- Q-2 Attempt all questions**
- (a) Enumerate various methods used for water softening and Explain Zeolite process with sketch. 07
- (b) What are the various system of sanitation? State the merits and demerits of each system. 07
- Q-3 Attempt all questions**
- (a) Explain working of Trickling filter with sketch. 07
- (b) Explain factor affecting per capita demand of water. 07
- Q-4 Attempt all questions**
- (a) Design a circular sedimentation tank for a city having population of 100000 with a water supply of 150 liter per capita per day. Assume an overflow rate of 35 m³/day/m². 07
- (b) Explain methods of disinfection of water. 07
- Q-5 Attempt all questions**
- (a) Design a bar screen for a peak average flow of sewage is 50 million litres per day. 07
- (b) Enlist the population forecasting methods and describe any two of them. 07
- Q-6 Attempt all questions**
- (a) Design a septic tank for a hostel building with 100 student. Water supply rate as 130 litre/person/day. Take detention period is 30 hours, rate of desposition of sludge as 30 litre/capita/year. Assume other suitable data. 05
- (b) Explain aerobic suspended growth treatment of domestic waste water. 05
- (c) Explain sludge drying bed with sketch. 04
- Q-7 Attempt all questions**
- (a) Explain working of pressure filter (Horizontal type) with sketch. 05
- (b) Explain coagulation, flocculation & sedimentation process. 05
- (c) Write a short note on: Oxidation pond. 04
- Q-8 Attempt all questions**
- (a) What is filtration? Explain the theory of filtration. 05
- (b) What are the differences in the design of water supply pipes and sewer pipes? Explain. 05
- (c) Explain the term break point chlorination and super chlorination. 04

