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Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act 1956)

SCHOOL OF CIVIL ENGINEERING

Continuous Assessment Test - II, March 2019

B. Tech. (Civil Engineering), Winter Semester, 2018 - 19

Course Code : CLE1006 **Duration** : 90 Minutes.
Course Name : Environmental Engineering **Max. Marks** : 50
Faculty-In-Charge: Bhaskar Das & Parimala Renganayaki **Slot** : E1

Section – A (15 x 2 = 30 Marks)

1. A settling column analysis is run on a type-I suspension. The settling column is 2 m tall and data are shown below.

Time (min)	0	60	80	100	130	200	240	420
Conc. (mg/L)	300	189	180	168	156	111	78	27

What will be theoretical removal efficiency in a settling basin with a loading rate of 25 m³/(m².day)?

2. Below given the monthly average jar testing report of the plant having 12 MLD capacity. Find the most economical coagulant for the plant per month on the basis of following information.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SA (mg/L)	36	38	38	32	32	38	58	70	55	52	36	39
LPAC (mg/L)	22	26	32	30	36	36	32	45	35	24	24	24
PPAC (mg/L)	18	22	26	32	34	34	25	32	23	24	21	20

The cost of SA, LPAC, and PPAC is Rs. 18/kg, Rs. 24/L and Rs. 32/kg respectively. Assume any data if required.

Section – B (2 x 10 = 20 Marks)

3. An effluent 4800 m³/day flowrate to be disinfected at the level of 99.9% through chlorine. Find the Ct value required for the disinfection on the basis of following observation. Laboratory study shows that the concentration of 1.2 mg/L of free available chlorine yield 99.4% kill of microorganism in 15 mins. Assume that Chick's Law and Watson's Law hold with n=1.
4. The average hardness level in the borewell water in VIT is found to be 800 mg/L as CaCO₃. What are the problems associated with this level of hardness? Explain the most suitable method for reducing this hardness.

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