M. Tech. –III (Chemical Engineering) (CBCS – 2015 Course) :
SUMMER - 2019
SUBJECT: ELECTIVE-I : INDUSTRIAL WASTE WATER TREATMENT

Day: Friday
Date: 17/05/2019
S-2019-3565
Time: 11.00 AM TO 02.00 PM
Max Marks.: 60

N.B. :

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagram **WHEREVER** necessary.
4) Assume suitable data if necessary.

SECTION - I

Q.1 Classify the various chemical industries with their special pollutant characteristics. **(10)**

OR

Q.1 How do you characterize the organic and inorganic pollutants of chemical Industries? **(10)**

Q.2 Explain the processing of settling mechanism in waste water treatment. **(10)**

OR

Q.2 Derive an expression for the design of settling chamber for the calculation of settling area and determine the diameter of settling chamber using L/D ratio as 2:1. **(10)**

Q.3 Explain the salient feature of how equalization in waster water treatment plant. **(10)**

OR

Q.3 Design an Aerated grit chamber installation for an average flow rate of 0.3 m^3/s and a peak flow rate of 1.0 m^3/s. The average depth is 3 meters. The width to depth ratio is 1.5:1, and the determined time at peak flow is 3.5 min. The aeration rate is 0.4 m^3/min per meter of tank length. Determine the dimension of the grit chambers and the total air required. Use two chambers. **(10)**

SECTION - II

Q.4 Define an aerobic digestion? With the help of neat sketch explain the process of sludge digestion. **(10)**

OR

Q.4 Determine the liquid volume before and after digestion and percentage reduction of 500kg (dry basis) of primary sludge with the following characteristics. **(10)**

Content	Primary	Digested
Solid %	5	10
Volume matter %	60	60
Sp. gravity of fixed solids	2.5	2.5
Sp. gravity of volatile solids	≈ 1.0	≈1.0

Q.5 Describe Ion exchange process, as a advanced waste water treatment. **(10)**

OR

Q.5 Explain the salient features of method for Nitrogen removal. **(10)**

Q.6 Enumerate all the steps and process required in the design consideration for sludge composting. **(10)**

OR

Q.6 How would you make risk assessment in case of hazardous waste solid management? **(10)**

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