

BACHELOR OF ENGINEERING (F.T.B.E) EXAMINATION, 2018

(4th Year -2nd Semester)**Waste Treatment Engineering**

Time: 3 hrs.

Use separate Answer Script for each Part

Full Marks : 100

Part – I (50 Marks)(Answer any three questions from this part; $16 \times 3 = 48$; 2 marks for to-the-point answering and neatness)

1. (a) Briefly describe how the BOD of a waste water can be measured in the laboratory. Why it is necessary to measure the BOD of a waste water?
- (b) The data given in the table below on oxygen utilization are available from the BOD tests of waste water. Obtain the values of k (rate constant) and L_0 (concentration of organic matter present initially) using the BOD equation, by using log difference method.

t(day)	mg / liter of BOD y (organic matter oxidized up to time t)
0	0.0
1	10.0
2	17.0
3	21.0
4	25.0
5	28.5
6	29.0
7	32.0

(3+3) + 10)

2. Write short note on (any two) (8 x 2)

- (a) Oxygen sag curve
- (b) Working principle of facultative lagoon for the treatment of waste water
- (c) Graphical representation of typical BOD curve for oxidation of carbonaceous and nitrogenous materials
- (d) Determination procedure of COD value of a waste water

P.T.O

3. Discuss the characteristics of the industrial wastes coming from different types of food and chemical industries. Discuss the important factors which affect the planning for an industrial waste water treatment plant, depending upon the mode of discharge of the waste and the nature of the constituents present in it ? What are the processes carried to achieve the target? (6+6+4)
4. Which are the two important parameters commonly utilized to study the settling characteristics of sludge by sedimentation tests which are performed in the laboratory. How the SVI and F/M parameters are expressed? Show by diagram the typical correlation of SVI and ZSV with F/M ratio. (4+4+8)
5. Answer any two: (8 x 2 = 16)
- (i) Discuss the working principle of Trickling Filter
 - (ii) Discuss the working principle of activated sludge process
 - (iii) Discuss the procedure for continuous digestion of sludge by anaerobic process

EX/ FTBE / T / 423 /2018

BACHELOR OF ENGINEERING IN FOOD TECHNOLOGY &

BIOCHEMICAL ENGINEERING EXAMINATION, 2018

(Final Year – Second Semester)

WASTE TREATMENT ENGINEERING

Time: Three hours

Full Marks: 100

Use separate Answer Script for each Part

PART II (50 Marks)

Different parts of the same question should be answered together.

Answer any One from (a) and (b), and also any One (c) and (d) in this block.

1. (a) Describe what do you mean by oxygen saturation concentration of waste water.

(b) Describe a method of determination of BOD. (5)

(c) Describe how would you determine the overall mass transfer co-efficient $K_L a$ for unsteady state condition for tap water.

(d) Describe a surface aeration unit using agitation. (10)

[Turn over

2. Answer any Two from (a), (b), and (c), and also

any One from (d) and (e) in this block :

- (a) Differentiate between BOD and COD.
 - (b) Differentiate between TSS and MLVSS.
 - (c) Differentiate between aerobic process and anaerobic process. (5*2 =10)
 - (d) Differentiate TOD and TOC.
 - (e) Differentiate bio-filters and bio-clarifiers . (5*1 =5)
-

3. Answer any Two from (a), (b), and (c) in this block (10 *2 = 20)

- (a) Explain the formulation of continuous biological reactors.
- (b) Explain the relationship for optimum settling conditions of sludge.
- (c) Explain the parameter required to design a sewerage treatment plant..