Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI • EXAMINATION – SUMMER • 2014**

**Subject Code: 161304** **Date: 05-12-2014**

**Subject Name: Biological Processes For Waste Water Treatment**

**Time: 10:30 am - 01:00 pm** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

**Q-1** (a) Enlist & Explain the Factors Affecting the BOD test. **07**

(b)Write the Difference Between **07**

(1) Suspended Growth & Attached Growth Process

(2) Aerobic & Anaerobic Treatment Process.

**Q-2** (a) Describe in Brief Classification of Biological Treatment Processes. **07**

(b) Write a short note on Root Zone Treatment. **07**

OR

(b) Explain in detail Anaerobic Sludge Digestion. **07**

**Q-3** (a) Derive the Relationship to Find the Amount of Methane per gram of COD. **07**

(b) A sample of wastewater was incubated for 7 days at 20 ºC and BOD result is 208 mg/l, BOD rate constant K = 0.15 day-1. Calculate (i) 5 – day BOD (ii) 10– Day BOD **07**

OR

**Q-3** (a) With the help of neat Sketch Explain Working of Rotating Biological Contractor. **07**

(b) Write a Short note on Bio Towers. **07**

**Q-4** (a)Write a Short note on **07**

(1) Step Feed process

(2)Contact Stabilization.

(b) Enlist the Different types of Natural Treatment Systems & Describe any Two. **07**

OR

**Q-4** (a) Differentiate between the Oxidation Ditch & oxidation Ponds. **07**

(b) Enlist & Explain the Special Problems of Waste Water Treatment Specific to Small Communities. **07**

**Q-5** (a) Define : **07**

(1) Yield Coefficient (2). Sludge Retention Time (SRT) (3).Specific Growth Rate (4). Endogenous decay of co-efficient (5). F/M Ratio (6). Half Velocity Constant

(b) Write down the mass balance for CFSTR without recycle and hence Derive the equation for finding biokinetic constant. **07**

OR

**Q-5** (a) Give the Classification of Trickling Filter & Application of each type. **07**

(b) Determine the values of Co-efficient K,Ks,Y,kd,µm From the following data. Derive From a bench Scale activated Sludge Study using CFSTR Without Recycle. **07**

| Unit no. | So (mg/l) | Se (mg/l) | Θ=θc (days) | X (mg/l) |
|---|---|---|---|---|
| 1 | 300 | 7 | 3.2 | 128 |
| 2 | 300 | 13 | 2 | 125 |
| 3 | 300 | 18 | 1.6 | 133 |
| 4 | 300 | 30 | 1.1 | 129 |
| 5 | 300 | 41 | 1.1 | 121 |

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