Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–V(New) • EXAMINATION – WINTER 2016**

**Subject Code:2153509** **Date:30/11/2016**

**Subject Name:Liquid Effluent Treatment-I**

**Time:10:30 AM to 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.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | | **Define the followings:** | **14** |
| | **1** | Flocculation | |
| | **2** | Coagulation | |
| | **3** | Chlorination | |
| | **4** | Facultative process | |
| | **5** | Anoxic process | |
| | **6** | Activated sludge | |
| | **7** | Water Demand | |
| | **8** | Reverse osmosis | |
| | **9** | BOD | |
| | **10** | Conductivity | |
| | **11** | Total solids | |
| | **12** | Hardness | |
| | **13** | COD | |
| | **14** | pH | |
| **Q.2** | **(a)** | Classify and discuss the wastewater. | **03** |
| | **(b)** | Enlist all the physical, chemical and biological characteristics of wastewater. | **04** |
| | **(c)** | Explain the importance of determination of solids in wastewater. How do you determine the suspended solids in a given sample of wastewater? | **07** |
| | | **OR** | |
| | **(c)** | What are the various requirements of a Good distribution system? Discuss the Grid iron layout of distribution system with advantage & disadvantage. | **07** |
| **Q.3** | **(a)** | Discuss the role of neutralization & equalization tank in ETP. | **03** |
| | **(b)** | Deduce the expression for the first stage BOD | **04** |
| | **(c)** | State and describe four important test that may be carried out to know the characteristics of wastewater. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Draw a flow diagram of STP for large city. | **03** |
| | **(b)** | What do you mean by "Environmental Pollution"? Describe what happen when untreated sewage is discharged into a nearby stream. | **04** |
| | **(c)** | Define Sedimentation. Discuss the design aspects of horizontal flow sedimentation tank. | **07** |
| **Q.4** | **(a)** | Give a list of methods available for the treatment of industrial waste water. | **03** |
| | **(b)** | Discuss any five factors that affect per capita water demand. | **04** |
| | **(c)** | Give the flow diagram for 'the activated sludge process', and | **07** |

describe the working of the activated sludge plant.

**OR**

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Write short notes on water borne disease. | **03** |
| | **(b)** | Give a list of various types of water demands. Discuss the Domestic water demand. | **04** |
| | **(c)** | Explain with a neat sketch the working and construction of the trickling filter. What is the principle on which it works? | **07** |
| **Q.5** | **(a)** | Write short notes on constituents of coagulation sedimentation plant. | **03** |
| | **(b)** | Explain the working of UASB with suitable diagram. | **04** |
| | **(c)** | Why coagulant are used in the sewage treatment? Name a few coagulant used. Explain Zeta potential with suitable diagram. | **07** |

**OR**

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|---|---|---|---|
| **Q.5** | **(a)** | Write a short notes on membrane process. | **03** |
| | **(b)** | Explain the working of RBCs. | **04** |
| | **(c)** | Deduce the expression discrete particle settling. | **07** |

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