Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 171301 **Date:12/12/2015**

Subject Name: Advanced Wastewater Treatment Technologies

Time: 10:30am to 1:00pm **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)** Explain electrodialysis with a neat sketch **07**

(b) Define atleast seven frequently used terminologies for membrane separation **07**

Q.2 **(a)** Explain in detail activated carbon treatment **07**

(b) Treated and filtered wastewater can be recycled for use in irrigation. An important issue is odor removal prior to reuse. For a wastewater that has an initial concentration of 10 ppm of these compounds, the following test results are obtained when activated carbon is used to absorb them: **07**

Carbon added, mg/L	0.0	0.4	1.0	6.0
Concentration, ppm	10	6.9	4.5	1.5

Using the Freundlich isotherm, determine the minimum amount of activated carbon required to reduce the concentration to 0.20 ppm.

OR

(b) Enlist the environmental applications of Membranes. **07**

Q.3 **(a)** Draw only the neat sketches of geometric configurations of membrane modules **07**

(b) Enlist the available methods for the removal of nitrogen and phosphorus from wastewater. Explain any one in detail. **07**

OR

Q.3 **(a)** Explain the types of synthetic ion-exchange resin **07**

(b) Give detailed classification of Advanced Oxidation Processes **07**

Q.4 **(a)** Explain the environmental applications of Ion Exchange **07**

(b) Write a short note on Reed Beds **07**

OR

Q.4 **(a)** Enlist the applications of Advanced oxidation process **07**

(b) Explain in detail: Mechanized methods of Sludge Dewatering **07**

Q.5 **(a)** Write a short note: Anaerobic Membrane Bioreactors **07**

(b) Explain the issues in operation and maintenance of Membrane units **07**

OR

Q.5 **(a)** Write a short note: Hybrid Membrane Systems **07**

(b) Write a short note: Nutsche Filter **07**

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