

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

# GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –III Examination Dec. - 2011

Subject code: 731801

Date: 05/12/2011

Subject Name: Advanced Wastewater Treatment Technologies

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) It is proposed to reuse the treated wastewater from a dairy industry in the process. 07  
Enlist and discuss the possible operations and processes for such a reuse.
- (b) Describe the components of Membrane bioreactor, along with a neat sketch. 07
- Q.2** (a) Write a note on “The need for advanced wastewater treatment”. Give examples 07  
of the same.
- (b) Explain the construction and working of Filter press. 07
- OR
- (b) Write a short note on Nutsche filter. 07
- Q.3** (a) Explain the applications of membrane technologies in wastewater treatment. 07
- (b) Differentiate clearly between External MBR and Immersed MBR 07
- OR
- Q.3** (a) Answer the following questions : 07
- (i) Define the terms :Influent, Permeate and Reject
- (ii) Explain the term “flux”.
- (iii) What is Trans Membrane Pressure?
- (b) Differentiate between maintenance cleaning and recovery cleaning of MBR. 07  
Prepare a list of chemicals used for cleaning of MBR.
- Q.4** (a) Explain the mechanism of Reverse Osmosis and high light the advantage and 07  
disadvantages of RO.
- (b) Highlight the advantages and drawbacks of membrane bioreactors. 07
- OR
- Q.4** (a) Enlist the various advanced oxidation processes for removal of complex organic 08  
constituents of wastewater and explain any one in detail.
- (b) Write a short note on “Ion Exchange process” . 06
- Q.5** (a) Write short notes on: 08
- (i) Moving bed biological reactor.
- (ii) Static aerobic fixed film reactor
- (b) Identify the sources of sludge at the Sewage Treatment Plant and briefly describe 06  
the characteristics of each.
- OR
- Q.5** (a) Explain the advantages and disadvantages of Micro filtration and Ultra filtration 08
- (b) Discuss the advantages and limitation of ion exchange as compared to chemical 06  
precipitation softening.

\*\*\*\*\*