

**GUJARAT TECHNOLOGICAL UNIVERSITY****B.PHARM. - SEMESTER- VII • EXAMINATION – SUMMER-2016****Subject Code: 2270012****Date: 13/05/2016****Subject Name: Green Chemistry****Time: 2:30 PM to 5:30 PM****Total Marks: 80****Instructions:**

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

- Q.1** (a) Give introduction to Green chemistry. (6)  
(b) Write synthesis of the following compounds (5)  
I. Adipic acid  
II. Ibuprofen  
(c) Enumerate microwave assisted reaction in water. Explain reductions reaction in details. (5)
- Q.2** (a) Describe twelve principles of green chemistry with their examples. (6)  
(b) Give the reaction of, (5)  
I. Cannizzaro reaction  
II. Reformatsky reaction  
(c) Discuss in brief designing of green synthesis. (5)
- Q.3** (a) Explain uses of microwaves and ultrasonic energy. (6)  
(b) Add note on: Combinatorial green chemistry. (5)  
(c) Explain the limitations of green chemistry. (5)
- Q.4** (a) Give polymeric sulfonic acids reaction with examples. (6)  
(b) Explain oxidation and alkylation reactions of ultrasound assisted reactions. (5)  
(c) Give the synthesis route on, (5)  
I. 4- aminodiphenylamine  
II. Acetaldehyde
- Q.5** (a) Write a reaction of microwave assisted organic solvents, (6)  
I. Claisen rearrangement  
II. Decarboxylation  
III. Diels alder reaction  
(b) Explain techniques of biocatalysts. (5)  
(c) Give the application of green chemistry in industrial synthesis. (5)
- Q.6** (a) Short note on proliferation solvent less reactions. (6)  
(b) Discuss oxidation reaction of toluene and alcohols reaction of microwave assisted in water. (5)  
(c) Give advantages and limitations of biocatalysts. (5)
- Q.7** (a) Enumerate and explain microwave solvent free reactions (6)  
(b) Write a note on polymer supported catalysts. (5)  
(c) Write a note on green solvents. (5)

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