

GUJARAT TECHNOLOGICAL UNIVERSITY
ME – SEMESTER – III (New) • EXAMINATION – WINTER - 2020

Subject Code: 3730810**Date: 02/01/2021****Subject Name: Micro and Nano Manufacturing****Time: 10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss the scope for Micro and Nano fabrication in India. **07**
(b) Give your comments on the issues for commercialization of Micro and Nano technology. **07**
- Q.2** (a) What do you mean by the word 'Lithography'? Discuss the Lithography process and state its role in micromachining technologies. **07**
(b) Discuss the potential applications for micro and Nano technology based fabrication methods. **07**
- Q.3** (a) State the significance of precision micro and nano grinding process as micro and nano fabrication method. **07**
(b) Name various types of Spectrometers and Microscopes used for Micro and Nano fabrication. Discuss the role of spectrometers and microscopes for Micro and Nano fabrication of engineering products. **07**
- Q.4** (a) List various physical fabrication methods. Also discuss the characteristics and applications of physical fabrication methods as micro and Nano manufacturing Processes. **07**
(b) Briefly discuss about Laser-Based Micro and Nanofabrication techniques with its schematics and specific applications. **07**
- Q.5** (a) Briefly explain pulsed water drop micromachining process. **07**
(b) What do you mean by Nano material and Bio material? Briefly discuss about fabrications methods for used for Nano materials and Bio materials. **07**
- Q.6** (a) Give your thoughts on the role of micro and nano fabrication methods in meeting the social needs. **07**
(b) Discuss about the development of Nano particles and Nano composites. **07**
- Q.7** (a) Briefly discuss the fabrication methods for Nano chips, Nanotubes and Nanowires. **07**
(b) What is 3-D molecular modelling? Give your comments on the need of 3-D molecular modelling for Nano manufacturing. **07**
- Q.8** (a) Discuss about Computer Aided Nano Design. **07**
(b) Discuss about finite element analysis of microstructures. **07**
