

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE – SEMESTER – VII (NEW) EXAMINATION- WINTER 2018****Subject Code: 2170508****Date: 29/11/2018****Subject Name: Nano Technology****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
<b>Q.1</b> (a) Differentiate Wet and Dry Etching.	<b>03</b>
(b) Briefly elaborate the potential applications of nanodimensional materials in security, life science and electronics.	<b>04</b>
(c) Briefly compare between 'Top-down' and 'Bottom-up' approaches of fabrication of nanomaterials. Give examples of reduced dimensionality system (1D, 2D and 3D confinements).	<b>07</b>
<b>Q.2</b> (a) Classify the vapor deposition techniques used in Nano-technology.	<b>03</b>
(b) Briefly explain with an example the synthesis of nanomaterials in structured media.	<b>04</b>
(c) Discuss the differences between scanning electron microscopy (SEM) and transmission electron microscopy (TEM).	<b>07</b>
<b>OR</b>	
(c) Describe spray pyrolysis method for synthesis of ceramic nanopowder.	<b>07</b>
<b>Q.3</b> (a) Discuss application of Nano oxide as protective coatings.	<b>03</b>
(b) Discuss chemicals used in Etching.	<b>04</b>
(c) Discuss Co-precipitation method for making Nano-particles.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Discuss steps of Nano-lithography.	<b>03</b>
(b) Discuss Fabrication of Nano-wires using Template fabrication.	<b>04</b>
(c) Discuss the effect of nanometer length on the physico-chemical properties of materials such as diffusivity, solubility, elastic properties, melting point etc.	<b>07</b>
<b>Q.4</b> (a) Discuss the principle of Atomic force Microscope	<b>03</b>
(b) State a few safety and storage considerations of nanomaterial.	<b>04</b>
(c) Enlist the general methods of preparation of quantum dots of compounds semiconductors. Illustrate any one in details.	<b>07</b>

- Q.4** (a) Discuss type of Micro Emulsion. **03**
- (b) What is quantum dot? Give examples and state its industrial uses. **04**
- (c) Explain the principle of X-ray Diffraction analysis. What kind of information would you expect from the X-ray diffractogram. **07**
- Q.5** (a) What is nanosensor? Discuss theory advantages over their micro-scale and macro-scale counterparts. **03**
- (b) Discuss various application of Nano-technology in medical Science. **04**
- (c) Write a short note on any one (i) Grain Boundary engineering Or Zenner Pinning (ii) Nanocatalysts **07**

**OR**

- Q.5** (a) State the laws of crystallography. What is a Miller index? **03**
- (b) State if there is any disadvantage of using nanomaterials. **04**
- (c) Explain vapor condensation method for production of nanoparticles **07**

\*\*\*\*\*

www.FirstRanker.com