

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (New) EXAMINATION – WINTER 2018****Subject Code: 2133902****Date: 01/12/2018****Subject Name: Elements of Nanoscience and Nanotechnology-I****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.

			<b>MARKS</b>
<b>Q.1</b>	(a)	What do mean by Atomic Manipulation in the field of nanotechnology.	<b>03</b>
	(b)	Define: Nanoscience and Nanotechnology.	<b>04</b>
	(c)	Write a short note on dip pen nanolithography.	<b>07</b>
<b>Q.2</b>	(a)	What do you mean by epitaxial nature in thin film?	<b>03</b>
	(b)	Write down various technique used in characterization of nanostructured material.	<b>04</b>
	(c)	Write a short note on history of nanotechnology.	<b>07</b>
		<b>OR</b>	
	(c)	Write a short note on electrodeposition.	<b>07</b>
<b>Q.3</b>	(a)	Give the name of various technique for Micro- and Nanofabrication.	<b>03</b>
	(b)	Draw the schematic representation of various types of carbon nanotubes.	<b>04</b>
	(c)	Write a short note on CVD method for synthesis of nanostructured materials with necessary figures.	<b>07</b>
		<b>OR</b>	
<b>Q.3</b>	(a)	Give the use of Nanotechnology in the medical implants and battery.	<b>03</b>
	(b)	Explain in short: Purification of Carbon Nanotubes.	<b>04</b>
	(c)	Describe the various applications of Carbon Nanotubes.	<b>07</b>
<b>Q.4</b>	(a)	Define: Nanoholes and photons in the vicinity of solar cell.	<b>03</b>
	(b)	Describe Optoelectronics Devices.	<b>04</b>
	(c)	Write a short note on DSSC Solar Cell.	<b>07</b>
		<b>OR</b>	
<b>Q.4</b>	(a)	Define: Nano electronics.	<b>03</b>
	(b)	Describe: Ball Milling.	<b>04</b>
	(c)	Write a short note on E-Beam lithography for formation of nanostructured devices.	<b>07</b>
<b>Q.5</b>	(a)	Give drawbacks of liquid Electrolyte used in nanostructured solar cell.	<b>03</b>
	(b)	What do you mean by Quantum Computers?	<b>04</b>
	(c)	Write down Environmental Applications of Nanotechnology.	<b>07</b>
		<b>OR</b>	
<b>Q.5</b>	(a)	Define: Nano robots.	<b>03</b>
	(b)	What do mean by Microelectromechanical systems (MEMS).	<b>04</b>
	(c)	Explain how nanotechnology will affect our life in the future, give your vision.	<b>07</b>

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