

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 3133904****Date: 28/11/2019****Subject Name: Characterization Of Nanomaterials-I****Time: 02:30 PM TO 05:00 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) Define X ray diffractions.	<b>03</b>
(b) Explain Lau Conditions & Lau Method in short.	<b>04</b>
(c) Explain powder method in brief.	<b>07</b>
<b>Q.2</b> (a) What is Data Handling and Processing.	<b>03</b>
(b) Write working principle of X-Ray photoelectron Spectroscopy.	<b>04</b>
(c) Write short notes on Scanning Electron Microscopy (SEM).	<b>07</b>
<b>OR</b>	
(c) Write Working and principle of Energy Dispersive X-Ray Analysis (EDAX).	<b>07</b>
<b>Q.3</b> (a) Define Auger Electron.	<b>03</b>
(b) Write the short notes on image mode.	<b>04</b>
(c) Define specimen preparation pre thinning and final thinning steps.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Define modes of operations	<b>03</b>
(b) Write Advantages, disadvantages of Microscopy.	<b>04</b>
(c) Explain brief application of microscopy.	<b>07</b>
<b>Q.4</b> (a) What is the importance of characterization.	<b>03</b>
(b) Types of Ellipsometry define in short.	<b>04</b>
(c) Write working, principle of Transmission Electron Microscopy.	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) Define secondary electrons and primary electrons.	<b>03</b>
(b) Define the parameter in microscopy Image Formation and Resolution, Depth of Field	<b>04</b>
(c) Explain working, principle and construction of Atomic Force Microscopy	<b>07</b>
<b>Q.5</b> (a) What is x-ray define it.	<b>03</b>
(b) Write short notes on Backscattered Electrons.	<b>04</b>
(c) Write working, principle and construction of Ellipsometry.	<b>07</b>
<b>OR</b>	
<b>Q.5</b> (a) Explain in short Transducers.	<b>03</b>
(b) Explain braggs law with ray diagram.	<b>04</b>
(c) Draw ray diagram of light microscopy explain working principle.	<b>07</b>

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