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## **GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-IV (NEW) - EXAMINATION - SUMMER 2017** Subject Code: 2143905 Date: 12/06/2017 Subject Name: Characterization of Nanomaterials-II 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 Q.1 **Short Questions** 14 Write the full name of SQUID. 1 2 In which mathematical mechanism used in FTIR. 3 Write full form of AFM and MFM. 4 Write principle of VSM. 5 What kind of information we get in SOUID. 6 Write the difference between AFM and MFM. 7 What do you mean by atomic force? 8 Write the wavelength of infrared light. 9 Write the full form of FTIR. Write two conditions of IR absorption in the material. 10 Write classification of infrared band. 11 Define Tc in a superconducting material. 12 13 Types of SQUID. 14 Write the wavelength of UV light. Write the applications of Vibrating Sample Magnetometer **Q.2** 03 (a) (VSM). (b) Draw the layout of Vibrating Sample Magnetometer 04 (VSM). Give the application of FTIR in various fields of science, 07 (c) medical and engineering. OR Explain Impedance Spectroscopy. 07 (c) Write down different applications of AFM. **Q.3** 03 (a) Write down advantage and disadvantage of contact mode 04 **(b)** spectroscopy. Write down different applications of SQUID instrument. 07 (c) OR Write down different applications of MFM. 03 Q.3 **(a)** Write down advantage and disadvantage of non-contact 04 **(b)** mode Spectroscopy. Explain Atomic Force Microscopy (AFM). 07 (c) Write different application of Impedance Spectroscopy. 0.4 03 (a) Explain the Impedance Spectroscopy. 04 **(b)** Explain few applications of UV/Visible Spectroscopy in 07 (c) the field of nanotechnology. OR Q.4 (a) Explain the sample preparation for FTIR instrument. 03

(b) Explain working principle of FTIR instrument. 04

	(c)	Explain Magnetic Force Microscopy (MFM).	07
Q.5	<b>(a)</b>	Explain the construction of UV/Visible spectroscopy.	03
	<b>(b)</b>	Explain the working of UV/Visible spectroscopy.	04
	(c)	Write a short note on working of VSM.	07
		OR	
Q.5	(a)	Construct the diagram of SQUID and explain in short.	03
-	<b>(b)</b>	Draw the schematic diagram of UV/Visible spectroscopy.	04
	(c)	Explain characterization of a magnetic material using SQUID	07
	. /	instrument.	

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