

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3171931****Date:27/12/2021****Subject Name:Nanotechnology and surface Engineering****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Explain engineering scale of nano technology.	03
	(b) Briefly explain different classes of nano materials.	04
	(c) Discuss engineering applications of nano technology and its merits.	07
Q.2	(a) What is atomic force microscopy?	03
	(b) Briefly explain vapor condensation methods.	04
	(c) Briefly explain mechanical milling process.	07
OR		
Q.3	(c) Briefly explain photolithography.	07
	(a) What do you mean by surface engineering?	03
	(b) Explain hydro blasting method used for surface preparation.	04
	(c) Explain flame decomposition of metal organic precursors methods.	07
OR		
Q.3	(a) What do you mean by synthesis of nano materials?	03
	(b) Explain sand blasting method used for surface preparation.	04
	(c) Explain X-Ray diffraction (XRD)	07
Q.4	(a) What do you mean by nano sensors?	03
	(b) Discuss top down and bottom up approach.	04
	(c) Briefly explain surface modification by friction stir processing.	07
OR		
Q.4	(a) What is nano coating?	03
	(b) Classify methods for synthesis of nano materials.	04
	(c) Explain transmission electron microscopy (TEM)	07
Q.5	(a) Enlist different methods for surface modification.	03
	(b) Types of nano coatings and its applications.	04
	(c) Briefly explain electron beam lithography.	07
OR		
Q.5	(a) What do you mean by surface modification?	03
	(b) Explain vapor phase degreasing method used for surface preparation.	04
	(c) Explain scanning electron microscopy (SEM).	07
