

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024****Subject Code:3171931****Date:30-05-2024****Subject Name:Nanotechnology and surface Engineering****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Explain technological approaches to fabricate nanomaterials.	03
	(b) What do you mean by nanoscience and nanotechnology?	04
	(c) Discuss applications of Nano technology and its merits in the field of engineering.	07
Q.2	(a) Categorize the different Nano materials along with their sizes.	03
	(b) Briefly explain vapor condensation method.	04
	(c) Briefly explain photolithography.	07
	OR	
	(c) Explain Flame Spray Pyrolysis technique for nanomaterials	07
Q.3	(a) Classify Nano Coatings.	03
	(b) Explain physical properties of Nano Materials	04
	(c) Explain transmission electron microscopy (TEM).	07
	OR	
Q.3	(a) What do you mean by surface engineering?	03
	(b) Describe Atomic Force Microscopy.	04
	(c) Explain Scanning Electron Microscope (SEM).	07
Q.4	(a) Classify methods for synthesis of nano materials.	03
	(b) Describe the applications of coatings.	04
	(c) Explain Surface preparation by electrochemical method.	07
	OR	
Q.4	(a) Discuss top down and bottom-up approach.	03
	(b) Describe different properties required for coating.	04
	(c) Explain Surface preparation by Shot peening.	07
Q.5	(a) Enlist different methods for surface modification.	03
	(b) Explain one case study based on Surface modification of engineering component.	04
	(c) Describe surface modification by Ion Implantation	07
	OR	
Q.5	(a) Why Surface modification is required?	03
	(b) Explain one case study based on Nano coating of engineering component.	04
	(c) Describe surface modification by Plasma	07
