

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3171931****Date:06/06/2022****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) Describe different classes of nano-materials.	03
	(b) Discuss the usefulness of nano technology in surface engineering.	04
	(c) Explain the importance of nano science in present and discuss the challenges in applicability of nano technology.	07
Q.2	(a) Compare laser method and spray pyrolysis.	03
	(b) Differentiate top-down and bottom-up approach of synthesis.	04
	(c) Explain the vapor condensation method with neat sketch.	07
OR		
	(c) Enlist the sputtering methods and explain any one with neat sketch.	07
Q.3	(a) Enlist different tools used in characterization of nano-materials.	03
	(b) State the advantages and applications of XRD.	04
	(c) Explain UV visible spectroscopy in detail.	07
OR		
Q.3	(a) Explain Bragg's law.	03
	(b) Differentiate SEM and TEM.	04
	(c) Describe atomic force microscope in detail with neat sketch.	07
Q.4	(a) State the importance of surface coating.	03
	(b) State and explain the different coating defects.	04
	(c) Describe the applications of shot blasting.	07
OR		
Q.4	(a) Classify surface modification methods.	03
	(b) Compare the aluminum coating and cadmium plating.	04
	(c) Explain shot blasting process with neat sketch.	07
Q.5	(a) Compare CVD and PVD.	03
	(b) Which are the important properties of IVD coating?	04
	(c) Discuss the surface modification techniques using laser.	07
OR		
Q.5	(a) Define the processes: 1) Ion implementation, 2) Plasma nitriding and 3) Anodizing.	03
	(b) Describe the advantages and applications of IVD.	04
	(c) Explain the working principle of FSW process with neat sketch and enlist applications.	07
