

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2024****Subject Code:3152112****Date:23-05-2024****Subject Name:Nano Materials****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) What is Nanomaterial? Describe the History of Nanomaterial	03
	(b) State the examples of natural Nano materials	04
	(c) Elaborate the statement given by Feynman.- There is plenty of room at bottom”.	07
Q.2	(a) list various method of manufacturing the nonmaterial by Top down approach	03
	(b) state the advantages and disadvantages of top down approach	04
	(c) Synthesis of nanoparticles is a combination of two stage process, nucleation and growth -illustrate in detail	07
	OR	
	(c) Differentiate between thermal evaporation technique and e beam evaporation technique to synthesis the nano material	07
Q.3	(a) list various method of manufacturing the nano material by Bottom up approach	03
	(b) write note on bottom up approach	04
	(c) Elaborate the thin film growth based on DC sputtering process With neat sketch	07
	OR	
Q.3	(a) Draw the schematic diagram of RF-plasma enhanced CVD	03
	(b) Draw schematic of Laser ablation technique	04
	(c) write short note on sputtering	07
Q.4	(a) Differentiate between the micelle and reverse micelle structure	03
	(b) State the advantage sand disadvantages of Micro emulsion method	04
	(c) Write short note on equal channel angular extrusion. How it differ from convention extrusion process?	07
	OR	
Q.4	(a) classify the carbon nanostructure	03
	(b) Draw the Bucky ball structure	04
	(c) write short note on cryo rolling	07
Q.5	(a) What is a magnetic nanomaterial? State the application of it	03
	(b) Draw the schematic figure of Spray pyrolysis technique	04
	(c) write short note on sol gel method for synthesis of nano material	07
	OR	
Q.5	(a) List the application of graphine	03
	(b) What is milling? List the factors affecting the milling process to synthesis nanomaterials.	04
	(c) Explain in detail carbon Nanotubes with its application	07
