GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2017

Subject Code: 2173901   **Date:02/11/2017**

Subject Name: Application of CNT and Metallic Nanoparticles

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	**(a)**	Explain superfluid cluster?	03
	(b)	Explain geometric structure of metal nanoparticles?	04
	(c)	Name different fabrication techniques of CNT and describe laser evaporation briefly with suitable diagrams?	07
Q.2	**(a)**	Explain Magic Number?	03
	(b)	Explain electronic structure of metal nanoparticles?	04
	(c)	Discuss mechanical property of CNT?	07
		OR	
	(c)	Write a note on electronic property of CNT?	07
Q.3	**(a)**	Explain how metal nanoparticles can be used as Quantum Dot laser application?	03
	(b)	Write a note on utilization of metal nanoparticles in medical field applications?	04
	(c)	Discuss how metal nanoparticles can be used in solar energy conversions (Explain at least three)?	07
		OR	
Q.3	**(a)**	How CNTs can be used for biological applications?	03
	(b)	Discuss any one application of CNT Mechanical Applications?	04
	(c)	Discuss applications of CNT as Sensors and in electronics? (Explain at least one application in each.)	07
Q.4	**(a)**	Explain superfluid cluster?	03
	(b)	Discuss briefly microwave assisted synthesis?	04
	(c)	Discuss electrochemical method?	07
		OR	
Q.4	**(a)**	Name and draw the different structure of CNT?	03
	(b)	Explain Theoretical modeling of nanoparticles?	04
	(c)	Discuss optical property of CNT?	07
Q.5	**(a)**	Define phonons and acoustic phonons?	03
	(b)	Write a note on stabilization of nanoparticles?	04
	(c)	Explain co-precipitation and Solvothermal synthesis with suitable examples?	07
		OR	
Q.5	**(a)**	Explain vibrational properties of CNT with suitable diagram?	03
	(b)	Explain electronic structure of metal nanoparticles?	04
	(c)	Explain the formation of metal nanoparticles by laser induced evaporation of atoms from the surface of metal?	07

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