Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019

Subject Code: 2173901 Date: 23/11/2019

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 Magic Numbers of Metal Nanoclusters.	**03**
	(b)	Define Metal Nanoparticles and Mention Different Technique for synthesis.	**04**
	(c)	Explain the Structure of CNT with Figure. (Type, Chiral angle, Unite cell, No. of Carbon atoms, Diameter)	**07**
Q.2	**(a)**	Mention Different Synthesis Technique for CNT and also Purification Methods.	**03**
	(b)	Explain Mechanical and Vibrational Properties of CNT.	**04**
	(c)	Write a short note on Reverse Micelle Synthesis.	**07**
		OR	
	(c)	Explain all the Type of Wet Chemical Synthesis Technique.	**07**
Q.3	**(a)**	Describe Heat Transport Properties of CNT.	**03**
	(b)	Briefly Describe Line Group, Basics of SWNT and DWNT.	**04**
	(c)	Describe Geometric and Electronic Structure of Metal Nano Particles.	**07**
		OR	
Q.3	**(a)**	Describe Briefly any Three Biological Applications of CNT.	**03**
	(b)	Write a Short note on Nobel Metal Nano Particles.	**04**
	(c)	Mention and Describe any Five Properties of Carbon Nanotubes.	**07**
Q.4	**(a)**	Describe Phase Transfer Method and Electrochemical Method for MNPs' Synthesis.	**03**
	(b)	Differentiate Between Batch and flow reaction in Hydrothermal Synthesis.	**04**
	(c)	Write a Short Note on Metal Nano particles, its Synthesis, Importance of stabilization and field of Application.	**07**
		OR	
Q.4	**(a)**	Explain Solar energy based Application of MNPs.	**03**
	(b)	Write a Short note on Optical Properties of CNT.	**04**
	(c)	Describe Stabilization Mechanism of Metallic Nanoparticles and its types.	**07**
Q.5	**(a)**	Define Dative Bond.	**03**
	(b)	Describe Mechanical Application of CNT.	**04**
	(c)	Describe Medical Application of Metallic Nano Particles.	**07**
		OR	
Q.5	**(a)**	Explain Application of CNT in Electronics and Energy.	**03**
	(b)	Define Zeta Potential and Hence DLVO Theory	**04**
	(c)	Define Super Critical water and hence Explain Hydrothermal Synthesis for MNPs. Also Define Solvothermal Synthesis.	**07**

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