Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2163902 **Date: 01/05/2017**

Subject Name: Nanopolymers and Nano-composites

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		**Short Questions**	**14**
	1	Which of these is an example of organic polymers? a)Polyphosphates b) polysilicates c) ribonucleic acids	
	2	Polymers composed of various kinds of monomer are called …… (monomers/multipolymers).	
	3	Chemically modified natural polymers belong to a group of ……..(copolymers/ plastics).	
	4	The number of repeating units (mers) in the macromolecule is called a degree of ……(polymerization/monomers).	
	5	P =1000 can be considered as the limit above which the polymers occurs.Molecules below this limit are called…..	
	6	Spatial ……of polymers also causes an increase of their mechanical strength parameters.	
	7	Define Emulsifier.	
	8	Concentration must always be higher than the critical ……concentration.	
	9	The critical temperature lying near Tg of the polymer is called Minimum Film…….	
	10	……commonly used in swimwear, since its chlorine resistance. (PolyButylene Terephthalate / Poly Ethyl Acrylate).	
	11	…….nanocomposites have better thermal stability, and higher Young's modulus. (Intercalated/Exfoliated)	
	12	……..is a biodegradable polymer, which is extensively used in the microbial activity. (Polyhydroxibutirate(PHB)/Polyethylene(PE)	
	13	…….nanocomposite is used in keycaps of high-end computers because the texture is highly resistant to wear and tear. (PolyButylene Terephthalate / Poly Propylene)	
	14	Define Initiator	
Q.2	**(a)**	Define Melting Point (T_m).	**03**
	(b)	Explain heteropolymers.	**04**
	(c)	Write a short note on the Basic concept of polymers with its importance and applications.	**07**
		OR	
	(c)	Discuss the classification of polymers briefly with appropriate examples.	**07**

Q.3	**(a)**	Define Glass transition temperature (T_g).	**03**
	(b)	Discuss kinetics of chain growth reaction.	**04**
	(c)	Describe poly(butylene terephthlate) (PBT) based nanocomposites.	**07**

OR

Q.3	**(a)**	Define surface micelles.	**03**
	(b)	Define optical extinction of metal nanoparticles	**04**
	(c)	Write a short note on anionic and cationic polymerization.	**07**
Q.4	**(a)**	Define surface induced Nano patterns.	**03**
	(b)	Explain the Factors affecting Tg and Tm.	**04**
	(c)	Write a short note on Poly (ethylacrylate) / bentonitenanocomposites	**07**

OR

Q.4	**(a)**	Define cryo-chemical synthesis.	**03**
	(b)	What do you mean by Nanophase ceramic composites?	**04**
	(c)	Write a short note on polymer/calcium carbonate nanocomposites.	**07**
Q.5	**(a)**	Define the anionic polymerization.	**03**
	(b)	Write down advantage of the composite as compared to parent synthesis material.	**04**
	(c)	Write a short note on kinetics of chain growth reaction	**07**

OR

Q.5	**(a)**	Explain Silicon nitride based ceramics.	**03**
	(b)	What do you mean by machinable nanocomposite ceramics?	**04**
	(c)	Describe the Processing for Nanophase ceramic composites.	**07**

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