

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2017****Subject Code: 2163903****Date: 03/05/2017****Subject Name: Nanotechnology and Medicine****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.

		<b>MARKS</b>
<b>Q.1</b>	<b>Short Questions</b>	<b>14</b>
	1 1905,.....published a paper that estimated the diameter of a sugar molecular as about 1 nm. (Einstein or Max Konll).	
	2 Nanoparticle-based drug delivery was published by ..... (Kreuter 1994 or Iijima et al 1992).	
	3 FDA approved Abraxane <sup>TM</sup> , a taxane based on .....technology, for the treatment of breast cancer. (Nano or Bio ).	
	4 Nano capsules can be obtained by .....polymerization. (interfacial or complex ).	
	5 .....experiments have confirmed the localization of oligonucleotide in the aqueous core of the capsule (Zeta potential or XRD).	
	6 ..... are used in the preparation of nano capsules. (Surfactants or Acid ).	
	7 In biomedical applications, the most commonly used magnetic nanoparticle is superparamagnetic .....( $\text{Fe}_3\text{O}_4$ or $\text{MnO}_2$ ).	
	8 Write down chemical formula of Maghemite.	
	9 $^{99\text{m}}\text{Tc}$ used for treatment of ..... (Cancer or Teeth related wound repair)	
	10 Magnetofection was first described in a..... Patent by Harata et al. who used magnetic liposomes to transfect cells. ( Japanese or Indian )	
	11 Write down full form of FDA.	
	12 Micelles means.....	
	13 In Vivo means.....	
	14 Write down full form of PEG.	
<b>Q.2</b>	(a) Define Nanomedicine.	<b>03</b>
	(b) Define Nano biotechnology in the vicinity of Medicine.	<b>04</b>
	(c) Explain about the landmarks in the evolution of Nanomedicine	<b>07</b>
	<b>OR</b>	
	(c) Explain oil containing Nano capsules.	<b>07</b>
<b>Q.3</b>	(a) Define Nano capsule?	<b>03</b>
	(b) Explain Nano capsules containing an aqueous core.	<b>04</b>
	(c) Discuss characterization of Nano capsules.	<b>07</b>

**OR**

- Q.3** (a) What are Magnetic Nanoparticles? **03**  
(b) Explain the properties of magnetic materials in the vicinity of medicine. **04**  
(c) Explain Magnetic chemotherapy. **07**
- Q.4** (a) Give an idea about use of radioactive isotopes for cancer treatment. **03**  
(b) Write down few applications of magnetic nanoparticles as drug carriers. **04**  
(c) Explain magnetic hyperthermia. **07**

**OR**

- Q.4** (a) Define magnetic gene transfer. **03**  
(b) Explain any one the application of Gold Nanoparticles in the field of medical. **04**  
(c) Write a short note on Cyclodextrin Nanoparticles for drug delivery. **07**
- Q.5** (a) Define role of Maghemite ( $\text{Fe}_2\text{O}_3$ ) for the cancer treatment. **03**  
(b) Explain Bio- compatibility related issues associate with magnetic nanoparticles. **04**  
(c) Write short note on ceramic Nanoparticles in the vicinity of medicine and drugs delivery. **07**

**OR**

- Q.5** (a) Define in short, relation of Nano biotechnology to Nanomedicine **03**  
(b) Explain role of nanoparticles bound together in spherical shapes for the drug delivery. **04**  
(c) Write short note on Dendrimers for drug delivery. **07**

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