Printed page: 02 **Subject Code: AMTBT0115**

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY ,GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MASTER OF TECHNOLOGY (M. Tech)

(SEM: Ist Semester Theory Examination (2020-2021)

SUBJECT: NANO BIOTECHNOLOGY & TOXICOLOGY

Time: 3Hours **Max. Marks: 70**

General Instructions:

- All questions are compulsory. Answers should be brief and to the point.
- This Question paper consists of 02 pages & ...8.....questions.
- It comprises of three Sections, A, B, and C. You are to attempt all the sections.
- Section A -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- Section B - Question No-3 is Long answer type -I question with external choice carrying 4marks each. You need to attempt any five out of seven questions given.
- Section C - Question No. 4-8 are Long answer type –II (within unit choice) questions carrying 7marks each. You need to attempt any one part *a* or*b.*
- Students are instructed to cross the blank sheets before handing over the answer sheet to the invigilator.
- No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION – A

1.	**Answer all the parts-**		**[5x1=5]**	**CO**
a.	"There is a plenty of room at the bottom." This was stated by---------- a) Issac Newton b) Richard Feynman c) Eric Drexler d) Albert Einstein		**(1)**	**CO1**
b.	Carbon nano tubes are also called as _____ a) Bucky tubes b) Bulky tubes c) Bulk tubes d) Buck balls		**(1)**	**CO2**
c.	Glutaraldehyde is a _____ a) Metal b) Fixative c) Non-metal d) Atomic species		**(1)**	**CO3**
d.	Which of the following polymer type is not classified on the basis of its application and properties? a) Rubbers b) Plastics c) Fibres d) Synthetic		**(1)**	**CO4**
e.	If the nanomaterials destroy DNA double helix is called genotoxicity a) true **b)** false		**(1)**	**CO5**

2.	**Answer <u>all</u> the parts-**		**[5×2=10]**	**CO**
	a.	Enlist the two approaches of nanotechnology.	**(2)**	**CO1**
	b.	Explain the applications of carbon nano tubes?	**(2)**	**CO2**
	c.	Enlist the nano chemicals with their functions.	**(2)**	**CO3**
	d.	Explain the different components of a nanobiosensor.	**(2)**	**CO4**
	e.	What is bioavailability and toxicity?	**(2)**	**CO5**

SECTION – B

3.	**Answer any <u>five</u> of the following-**		**[5x4=20]**	**CO**
	a.	Explain the conceptual origin of nanotechnology.	**(4)**	**CO1**
	b.	Explain the role of nanotechnologist Richard Feynman and Eric K. Drexler in nanotechnology.	**(4)**	**CO1**
	c.	Differentiate between carbon nanotubes and bucky balls with applications	**(4)**	**CO2**
	d.	What are drug delivery vehicles? Explain liposomal method for drug delivery.	**(4)**	**CO3**
	e.	Draw the systematic diagram of nanowires and cantilevers.	**(4)**	**CO4**
	f.	Describe toxicodynamics dose Vs toxicity relationship.	**(4)**	**CO5**
	g.	Explain the principle and concept of toxicology.	**(4)**	**CO5**

SECTION – C

4	**Answer any one of the following-**		**[5×7=35]**	**CO**
	a.	What is the nanotechnology? Explain the role of nanotechnology in aerospace.	**(7)**	**CO1**
	b.	Explain the process of micro fabrication of p-type substrate with diagrammatic representation	**(7)**	**CO1**
5.	**Answer any <u>one</u> of the following-**			
	a.	How many methods of nanoparticles synthesis? Describe any on methods of silver nanoparticle synthesis. Justify that silver nanoparticles have good antimicrobial materials against pathogenic bacteria?	**(7)**	**CO2**
	b.	Enlist how many methods of carbon nanotube synthesis? Explain the applications and functionalization process of carbon nanotubes.	**(7)**	**CO2**
6.	**Answer any one of the following-**			
	a.	How does AFM work? How many modes of operations? Discuss each mode with advantages and disadvantages of AFM modes.	**(7)**	**CO3**
	b.	Distinguished between TEM and SEM with suitable examples and applications.	**(7)**	**CO3**
7.	**Answer any one of the following-**			
	a.	What are nanosensors? Explain the ideal characteristics and applications of bionanosensors.	**(7)**	**CO4**
	b.	How to detect and treat cancer tumor through improved diagnostics nano devices?	**(7)**	**CO4**
8.	**Answer any one of the following-**			
	a.	What is toxicokinetics? Distinguished cytotoxicity and genotoxicity.	**(7)**	**CO5**
	b.	Explain *in vitro* and *in vivo* toxicity analysis methods of nanomaterials.	**(7)**	**CO5**