Printed Page:- 03 **Subject Code:- ABT0603**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2023 - 2024)

Subject: Nanobiotechnology

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION-A 20

1. Attempt all parts:-

1-a. The prefix "nano" comes from a … 1

(a) French word meaning billion

(b) Greek word meaning dwarf

(c) Spanish word meaning particle

(d) Latin word meaning invisible

1-b. How many oxygen atoms lined up in a row would fit in a one nanometer space? (CO1) 1

(a) None; an oxygen atom is bigger than 1 nm

(b) One

(c) Seven

(d) Seventy

1-c. Other name of carbon nanotubes is 1

(a) Bulky tube

(b) Buckytube

(c) Bulk balls

(d) Buckyball

1-d. C60 is easily soluble in _____ 1

(a) Water

(b) Ammonia

(c) HCl
(d) Benzene

1-e. Expand XRD 1

(a) X-ray
(b) X-ray diffraction
(c) X-ray diode
(d) X-ray dot

1-f. Glutaraldehyde is a _____ 1

(a) metal
(b) fixative
(c) non-metal
(d) atomic species

1-g. Which among the following polymers have lowest solubillty? 1

(a) polyethylene
(b) polystyrene
(c) nylon 6
(d) epoxy resin

1-h. Oral administrative involves the treatment of which area? 1

(a) Skin
(b) Eye
(c) Ears
(d) Lungs

1-i. Which of the following is the physico-chemical component? 1

(a) Enzymes
(b) Anti-bodies
(c) Transducer
(d) Cells or tissues

1-j. Which one of the following comes under quantum dots? 1

(a) CdSe
(b) ZnS
(c) Both
(d) None

2. Attempt all parts:-

2.a. What is Immuno-nanotechnology? 2

2.b. What is Buckyball? 2

2.c. Write the name of two techniques to synthesize metal nanoparticles. (CO3) 2

2.d. What are polymers? Discuss their role in nanotechnology. 2

2.e.	What are the liposomes?	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Explain the Bottom-up and Top-down approaches of nanotechnology.	6
3-b.	Explain the Moore's law?	6
3-c.	Explain the different applications of metal nanoparticles.	6
3-d.	Compare single wall carbon nanotube (SWCNT) and multi wall carbon nanotube (MWCNT).	6
3.e.	What is FTIR principle in nanoparticles?	6
3.f.	How are biomaterials classified? And discuss the uses of Biomaterials.	6
3.g.	Describe various approaches for the improvement of cancer detecting treatment by applying nanotechnology. (CO5)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	What do you understand by lithography in nanotechnology? Discuss the concept, principle and applications of lithography in nanotechnology. (CO1)	10
4-b.	What are the micro fabrication process? How to differ from nanofabrication? Explain with examples.	10

5. Answer any one of the following:-

5-a.	How many methods of nanoparticles synthesis? Explain chemical methods of NPs in details.	10
5-b.	What are the properties of a nanoparticle? Explain the bomedical applications of NPs.	10

6. Answer any one of the following:-

6-a.	How should nanomaterials be assessed once they have been developed? Give a thorough explanation of two characterisation techniques.	10
6-b.	Why XRD is used for nanoparticles? Explain the properties and What type of detector is used in XRD?	10

7. Answer any one of the following:-

7-a.	Discuss the role of polymers and co-polymers in orthopaedics implants	10
7-b.	Explain the role of Nanobiotechnology in Tissue Engineering	10

8. Answer any one of the following:-

8-a.	Describe the drug delivery mechanism. What are the nanoscale drug delivery devices?	10
8-b.	Explain a case study for tumor target through nanotechnology approach.	10