Printed Page:- 04 **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. Who first used the term nanotechnology and when? (CO1) 1

(a) Richard Feynman, 1959

(b) Norio Taniguchi, 1974

(c) Eric Drexler, 1986

(d) Sumio Iijima, 1991

1-b. Branched polymers are _____. 1

(a) SPIONS.

(b) Liposomes.

(c) Dendrimers.

(d) Block copolymers

1-c. Which one of these statements is NOT true? 1

(a) Gold at the nanoscale is red

(b) Copper at the nanoscale is transparent

(c) Silicon at the nanoscale is an insulator

(d) Aluminum at the nanoscale is highly combustible

1-d. What is graphene? 1

(a) A new material made from carbon nanotubes

(b) A one-atom thick sheet of carbon

(c) Thin film made from fullerenes

(d) A software tool to measure and graphically represent nanoparticles

1-e. Diffraction pattern provided the nanoarticles------ 1

(a) Crystallographic information

(b) Shapeinformation

(c) Size information

(d) Colour infornation

1-f. All of the following are useful as a source for UV-Visible, EXCEPT 1

(a) Globar source

(b) Xenon discharge lamp

(c) Deuterium discharge lamp

(d) Tungsten filament lamp

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

(a) polyethylene

(b) polystyrene

(c) nylon 6

(d) epoxy resin

1-h. Gels and hydrogels is used in which system? 1

(a) Ocular

(b) Orthopedics

(c) Cardiovascular

(d) None of the above

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

(a) CdSe

(b) ZnS

(c) Both

(d) None

1-j. Nano shells are used in the treatment of which of the following disease? (CO5) 1

(a) Alzheimer's.

(b) Cancer.

(c) HIV.

(d) Parkinsons.

2. Attempt all parts:-

2.a.	What is size of leucocytes, virus and proteins?	2
2.b.	What function do phytochemicals present in plants during the synthesis of nanoparticles by plants?	2
2.c.	Explain the term of dispersed and agglomerated gold nanoparticles.	2
2.d.	What polymers are used in ophthalmology?	2
2.e.	What is nanoimaging agents?	2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a.	What are the future prospective of nanobiotechnology	6
3-b.	Describe the mechanical,electrical and optical properties of nanomaterials.	6
3-c.	Write the name of capping agents in the synthesis of AgNPs and How to determine the size of nanoparticles?	6
3-d.	Write down the various approaches and methods used in the production of carbon nanotubes. (CO2)	6
3.e.	How does AFM work? Draw the forces versus distance curve	6
3.f.	Explain the pathways of drug absorption in ocular system.	6
3.g.	Define the Nanoshells, nanocapsule and nanosphere	6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a.	Explain the process of photolithography	10
4-b.	Explain the role ofNanotechnology in Food processing and packaging	10

5. Answer any <u>one</u> of the following:-

5-a.	Discuss the process and principle of zinc oxide nanoparticles synthesis from sol-gel methods.	10
5-b.	How do you synthesize carbon dots? Also discuss the applications of C-dots.	10

6. Answer any <u>one</u> of the following:-

6-a.	Explain UV and FTIR analysis of NPs and their significance.	10
6-b.	What is nanotechnology based drug delivery? Highlights the key benefits.	10

7. Answer any <u>one</u> of the following:-

7-a.	Discuss the role of nanoparticles and polymers in monitoring cardiovascular diseases. (CO4)	10
7-b.	Write a note on artificial organs and medical devices	10

8. Answer any <u>one</u> of the following:-

8-a.	What is quantum dot technology? Discuss their properties and applications.	10
8-b.	What is the liposome? Explain the use of drug delivery vehicles in medical nanotechnology	10