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Subject Code:- AMTBT0115

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**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**

**(An Autonomous Institute Affiliated to AKTU, Lucknow)**

**M.Tech**

**SEM: I - THEORY EXAMINATION (2022 - 2023)**

**Subject: Nano Biotechnology & Toxicology**

**Time: 3 Hours**

**Max. Marks: 70**

**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**

**15**

**1. Attempt all parts:-**

1-a. Which of these consumer products is already being made using nanotechnology methods? (CO1) 1

- (a) Fishing lure
- (b) Golf ball
- (c) Sunscreen lotion
- (d) All of the above

1-b. The colour of the nano gold particles is \_\_\_\_\_ (CO2) 1

- (a) Yellow
- (b) Orange
- (c) Red
- (d) Variable

1-c. What's the procedure in Top-down fabrication method? (CO3) 1

- (a) Nano-particles -> Powder -> Bulk
- (b) Powder -> Bulk -> Nano-particles

- (c) Bulk -> Powder - > Nano-particles  
(d) Nano-particle - > Bulk -> Powder
- 1-d. Nano sized polymers built from branched units are called \_\_\_\_\_ (CO4) 1  
(a) Dendrimers  
(b) Composites  
(c) Carbon-based materials  
(d) Metal-based materials
- 1-e. \_\_\_\_\_ of ceramic components are easier through nano structuring. (CO5) 1  
(a) Lubrication  
(b) Coating  
(c) Fabrication  
(d) Wear

**2. Attempt all parts:-**

- 2.a. Explain Biotemplating. (CO1) 2  
2.b. Write a short note on influence of pH on Biological Synthesis of Metal Nanoparticles. (CO2) 2  
2.c. Discuss Contact and Non contact Mode of AFM. (CO3) 2  
2.d. What is nanosensor technology? (CO4) 2  
2.e. Write a short note on Cytotoxicity. (CO5) 2

**SECTION B 20**

**3. Answer any five of the following:-**

- 3-a. Discuss some nanomaterials. (CO1) 4  
3-b. Explain the implication of Nanofabrication. (CO1) 4  
3-c. Discuss the structure and properties of carbon nanotubes. (CO2) 4  
3-d. Discuss the properties of carbon nanotubes. (CO2) 4  
3.e. Discuss the nano characterization techniques . (CO3) 4  
3.f. What are biosensors, describe its types? (CO4) 4  
3.g. Discuss protein and peptidal delivery. (CO5) 4

**SECTION C 35**

**4. Answer any one of the following:-**

- 4-a. Explain the biological synthesis of metal nanoparticles. (CO1) 7  
4-b. Write a note on biological applications of nanomaterials. Discuss its diagnostic 7

value. (CO1)

**5. Answer any one of the following:-**

- 5-a. Highlight the properties of carbon Nanotubes. (CO2) 7
- 5-b. Discuss in detail the types of Nanodevices used in clinical applications. (CO2) 7

**6. Answer any one of the following:-**

- 6-a. Draw schematic diagram and discuss the types of AFM. (CO3) 7
- 6-b. Discuss in detail about scanning electron Microscopy? (CO3) 7

**7. Answer any one of the following:-**

- 7-a. Discuss Nano vs. Traditional Drug Delivery. (CO4) 7
- 7-b. Describe the role of nanomaterials in cardiovascular system with suitable examples. (CO4) 7

**8. Answer any one of the following:-**

- 8-a. Discuss the cytotoxicity in nano material. (CO5) 7
- 8-b. Explain the concept of biomaterials? How biomaterials play an important role in pharmaceuticals and orthopedic implants. (CO5) 7