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B.Tech. DEGREE EXAMINATION, JULY 2022

Fourth Semester

18NTO301T – APPLICATIONS OF NANOTECHNOLOGY

(For the candidates admitted during the academic year 2020 - 2021 & 2021 - 2022)

Note:

(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours | Max. Marks: 75

PART – A (25 × 1 = 25 Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
1. _____ have a property of colour production which was used in pesticide detection. (A) Graphene-NPs (B) Au-NPs (C) Ag-NPs (D) Carbon Nano Tubes	1	1	1	3
2. Pesticide degradation is one of the _____ process. (A) Biomonitoring (B) Nanomonotoring (C) Nano bioremediation (D) Bioremediation	1	2	1	1
3. _____ measures the changes in colour, fluorescence or electrical potential either directly or indirectly. (A) HRTEM (B) Biosensors (C) SEM (D) Filters	1	2	1	3
4. Nanomaterials are considered as unique and important materials due to its _____. (A) Bulk properties (B) Size (C) Structure (D) Novel properties and functions	1	1	1	1
5. "There is a plenty of room at the bottom" said by American Physicist _____. (A) Einstein (B) Richard Feynman (C) Norio Taniguichi (D) Maxwell	1	2	1	1
6. Which of the biosensors use the principle of heat released or absorbed by a reaction (A) Potentiometric biosensor (B) Optical biosensors (C) Piezo-electric biosensors (D) Calorimetric biosensors	1	1	2	4
7. What is fertilization? (A) Adding or applying substances to the soil as food for plants (B) Supplying water to fields for the crops (C) Using living organisms to improve products (D) Growing only one crop in a large given area	1	1	2	2

8. What new technology is used to determine crop needs and crop health in precision farming? 1 1 2 2

(A) Global positioning system (B) Fortune teller
(C) Professional medical system (D) Gigantic positioning satellite

9. Which problem occurs if too much fertilizer is used? 1 2 2 4

(A) Lack of minerals and salt in the soil (B) Contaminated water
(C) Flooding of the soil (D) Oversized harvest

10. _____ deficiency is a most common micronutrient problem that adversely affects agricultural production in alkaline soils with calcium carbonate 1 1 2 4

(A) Carbon (B) Zinc
(C) Titanium (D) Silver

11. Flow of electrons in semiconducting materials or in vacuum devices are known as _____. 1 2 3 1

(A) Electricity (B) Electronics
(C) Spintronics (D) Thermo-electricity

12. Carbon nanotube can be used as wires due to _____ which will reduce transmission power loss. 1 2 3 1

(A) Lower resistance (B) Lower mechanical strength
(C) Increases heat emission (D) Lower ductility

13. _____ have been recognized as next generation photonic and electronic dominant components due to its efficient collection of photo generated carriers when core and shell segments are engineered to be thinner than minority carrier diffusion lengths. 1 1 3 1

(A) Spintronics devices (B) Thermoelectric devices
(C) Magnetocaloric devices (D) Semiconductor nanowires

14. _____ is the traditional ceramics which are made from raw materials possess on clay, followed by heating 1 2 3 4

(A) Gemstone (B) Nanoclay
(C) Porcelain (D) Synthetic stone

15. _____ based metallic conductors can be used as wires and coils to replace copper wire conductor in a small electric transformer 1 2 3 4

(A) Silicon (B) Carbon nanotube
(C) Fullerene (D) Aluminium

16. In _____ method the nanofibers prepared under the application of water pressure on one side and restrain from the porous membrane causes extrusion of the polymer. 1 1 4 3

(A) Template synthesis (B) Wet chemical synthesis
(C) Sol-Gel synthesis (D) Self-Assemble synthesis

17. In electro spinning process, the DC voltage supply in the range of _____. 1 2 4 2

(A) Micro volt (B) Milli volt
(C) Kilo volt (D) Mega volt

18.	Molecular entanglement of solution increases when polymer has higher _____.	1	2	4	2
	(A) Molecular weight (B) Molar concentration (C) Solubility (D) pH value				
19.	_____ and its copolymers were commonly used in scaffold fabrication	1	1	4	3
	(A) Polysulfone (B) Polylactic acid (C) Polystyrene (D) Polyethylene				
20.	Higher voltage leads to stretching of the solution due to great _____ forces.	1	1	4	3
	(A) Electrostatic (B) Vander Waal's (C) Magnetic (D) Columbic				
21.	_____ have been considered as excellent tumor-targeting vehicles.	1	2	5	1
	(A) Phorphyrins (B) Nanoparticles (C) Lysosomes (D) Dyes				
22.	_____ nanoparticles have been in the bio-imaging spotlight due to their special optical properties.	1	1	5	5
	(A) Gold (B) Terbium (C) Silver (D) Zinc sulphide				
23.	_____ can be used to study cellular processes, and monitor or recognize disruption or alternations in the cellular processes of cancer cells.	1	2	5	1
	(A) Biomarkers (B) Phorphyrins (C) Lysosomes (D) Dyes				
24.	_____ are an exciting material to work with due to their unique optical properties compared to traditional organic fluorescent labels.	1	2	5	1
	(A) Phorphyrins (B) Quantum dots (C) Gold (D) Dyes				
25.	The low photobleaching threshold and broad absorption/ emission peak width of _____ have hindered their used in long term imaging.	1	1	5	5
	(A) Fluorescent dyes (B) Quantum dots (C) Gold nanoparticles (D) Peptides				

PART – B (5 × 10 = 50 Marks)

Answer **ALL** Questions

		Marks	BL	CO	PO
26. a.	Give a detailed account of air pollutant and its classification, also explain how to overcome those issues through nanotechnology.	10	4	1	1
	(OR)				
b.	Discuss in elaborate manner about nanobioremediation.	10	3	1	1
27. a.	Explicate the nanotechniques used in food industries for food packaging and preservation.	10	4	2	4
	(OR)				

	b. With a neat sketch illustrate about the various components of bio-nano sensors and its mechanism.	10	4	2	2
28.	a. Discuss in detail on the impact of nanomaterials in electrical and electronic components.	10	4	3	1
	(OR)				
	b. Discuss on different types of fuel cell. Examine the different types of nanomaterials reported for fuel cell applications.	10	3	3	4
29.	a. Explain the process and parameters involved in electro spinning technique for fiber production.	10	3	4	2
	(OR)				
	b. Give a detailed account on self-cleaning and flame retardant finishes in textiles.	10	4	4	3
30.	a. Describe the contribution of Upconversion nanoparticles in biomedical applications.	10	3	5	3
	(OR)				
	b. Outline the importance of scaffolds in tissue engineering and explain its properties.	10	3	5	1

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