LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**

FIFTH SEMESTER – **APRIL 2024**

UPB 5602 – NANOTECHNOLOGY

Date: 13-04-2024 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

	SECTION A - K1 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
1.	**Fill in the blanks**
a)	The construction of nanomaterials from the bulk scale to nanoscale is called _____ approach.
b)	The Roman pottery in which nanoparticles were first reported to be used is _____ cup.
c)	_____ nanomaterials are used in solar cells for energy storage.
d)	Polymeric nanotubes are _____materials with a tubular nanostructure.
e)	The construction of 2-D and 3-D structures using DNA is called _____
2.	**State whether the following statements are TRUE or FALSE**
a)	Nanoparticles are highly reactive due to their low surface area to volume ratio.
b)	The visible range of the electromagnetic spectrum spans from 190 – 390 nm.
c)	The C25 carbon molecule is commonly called bucky ball.
d)	Nanorods are used in cancer therapy.
e)	Nano socks treated with silver nano particles acts against infection and odour.
	SECTION A - K2 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
3.	**Choose the correct answer**
a)	The first talk about Nanotechnology was given by _____ a)Albert Einstein b) F. Meisher c) Sir Isaac Newton d) Richard Feynman
b)	---------- microscope is not used in characterization of nanoparticles a) SEM b) TEM c) Phase contrast d) AFM
c)	_____ basically semiconductor nanoparticles that show a particular colour on illumination by a light. a)CNTs b) Nanowires c) Quantum dots d) Fullerenes
d)	Nanomaterials can confer cytotoxicity by: a) Generating free radicals b) Disrupting membrane potential c) Promoting apoptosis d) all of the above
e)	Coating the nano crystals with the ceramics is carried that leads to _____ a) Corrosion b) Corrosion resistant c) Wear and tear d) Soft
4.	**Answer the following, each in about 50 words**
a)	Outline the property of the nanoscale.
b)	State Beer-Lambert's law.
c)	Explain the magnetic properties of nanoparticles.
d)	What are dendrimers?
e)	Compare scaffold with staple DNA .

	SECTION B - K3 (CO2)
	Answer any TWO of the following in 500 words (2 x 10 = 20) **Draw diagrams / flowcharts wherever necessary**
5.	Apply the principle and applications of photoluminescence.
6.	Identify the properties and applications of nanowires.
7.	Construct and explain the working principle of Transmission Electron Microscope.
8.	Organize the health hazards of nanotechnology.
	SECTION C – K4 (CO3)
	Answer any TWO of the following in 500 words (2 x 10 = 20) **Draw diagrams / flowcharts wherever necessary**
9.	Analyze the principle and significance of Surface Plasmon resonance.
10.	Examine the applications of nanoparticles in food industry.
11.	List out the applications of solid lipid nanoparticles (SLN).
12.	Discover the principle, methodology and applications in the biosynthesis of nanoparticles.
	SECTION D – K5 (CO4)
	Answer any ONE of the following in 1000 words (1 x 20 = 20) **Draw diagrams / flowcharts wherever necessary**
13.	Evaluate in detail on the discovery, properties and applications of graphene.
14.	Assess the role and significance of polymeric nanotubes and the biopolymeric materials utilized in the drug delivery systems.
	SECTION E – K6 (CO5)
	Answer any ONE of the following in 1000 words (1 x 20 = 20) **Draw diagrams / flowcharts wherever necessary**
15.	Elaborate on the construction, working, advantages, disadvantages and applications of AFM.
16.	Discuss in detail on the principle and applications of nanobioremediation.

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