18BTP17

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2023
(Third Semester)

Branch – **BIOTECHNOLOGY**

NANO BIOTECHNOLOGY

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 Who coined the word "nanobiotechnology"?
(i) Eric Drexler (ii) Richard Feynmann
(iii) Sumio Tijima (iv) Richard Smalley

2 1 micrometer = _____ m.
(i) 10^{-3} (ii) 10^{-6}
(iii) 10^{-8} (iv) 10^{-9}

3 The size of nanoparticle is between _____ nm.
(i) 0.01 to 1 (ii) 0.1 to 10
(iii) 1 to 100 (iv) 100 to 1000

4 Which disease is a major focus for nanotechnology?
(i) Hair loss (ii) Cancer
(iii) AIDS (iv) Tooth decay

5 How is nanotechnology used in the medical community?
(i) Testing and diagnosis (ii) Tissue engineering
(iii) Drug delivery (iv) All of the above

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Differentiate between top down and bottom up approach.
OR
b Analyze the applications of Transmission Electron Microscopy.

7 a Discuss the functions of neuronal cell.
OR
b Add a short note on natural nanocomposites.

8 a Categorize the topographic properties of DNA.
OR
b Outline the applications of DNA protein conjugate based sensors.

Cont...

9 a Outline the principle of bio-barcode assay.

OR

b Evaluate the applications of magnetic nanoparticles in cancer cell targeting.

10 a Discuss the application of process of electrospinning used for tissue engineering.

OR

b Outline the concept of MEMS.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Detail the principle and working of AFM.

OR

b Add a note on the properties and applications of the following.
(i) Fullerene (ii) Quantum dots

12 a Discuss in detail about the biologically inspired nanocomposites with suitable example.

OR

b Explain the process of silicon modeling of neuronal cells by NLSI circuits.

13 a Outline the idea of enzyme nanoparticle hybrid sensors and its applications.

OR

b Analyze the principle and application of DNA profiling.

14 a Elaborate the application of nanotechnology in *in vivo* imaging capabilities with suitable example.

OR

b Outline the application of magnetic nanoparticles in cancer cell targeting.

15 a Illustrate the method of nano finishing used in textile industry.

OR

b Discuss the application of nanotechnology as lab-on-a-chip for biochemical analysis.

Z-Z-Z END