

**M. Sc. DEGREE EXAMINATION, APRIL 2024**  
**BIOTECHNOLOGY**  
**FOURTH SEMESTER**

**COURSE : CORE**  
**PAPER : BIO-NANOTECHNOLOGY**  
**SUBJECT CODE : 19BY/PC/BN44**  
**TIME : 3 HOURS** **MAX. MARKS: 100**

**SECTION – A**

**ANSWER ALL THE QUESTIONS** **(10 x 2 = 20)**

1. A nanometer is \_\_\_\_\_ m and nanoscale is upto \_\_\_\_\_ nm.  
a)  $10^9$ , 200 b)  $10^{-9}$ , 100  
c)  $10^9$ , 500 d)  $10^{-9}$ , 200
2. What is surface-to-volume ratio in nanomaterials?
3. \_\_\_\_\_ are zero – dimensional and \_\_\_\_\_ are two-dimensional nanomaterials respectively.  
a) nanosheets and nanorods b) fullerenes, graphene  
c) nanofibres, nanowires d) nanowires, quantum dots
4. What are biochips?
5. Nanoglasses are \_\_\_\_\_ materials and behave like \_\_\_\_\_.  
a) crystalline, paramagnets b) crystalline, ferromagnets  
c) non-crystalline, paramagnets d) non-crystalline, ferromagnets
6. Write a note on emulsion polymerization method.
7. \_\_\_\_\_ and \_\_\_\_\_ is an example of top-down approach.  
a) lithography, ball milling b) CVD, sol-gel method  
c) laser pyrolysis, CVD d) plasma arcing, wet synthesis
8. List any 4 uses of nanocatalysts.
9. \_\_\_\_\_ nanoparticles are used in \_\_\_\_\_.  
a) keratin, cancer b) pectin, dentistry.  
c) chitosan, dentistry d) PEG, cancer.
10. List any 4 polymeric nanoparticles in cancer therapy.

**SECTION – B**

**ANSWER ALL THE QUESTIONS** **(5 x 8 = 40)**

11. a. Enlist the historical background of nanotechnology.  
**OR**  
b. Discuss briefly on the properties of nanomaterials.
12. a. Enumerate the properties and applications of quantum dots.  
**OR**  
b. Give a brief account on biological nanomaterials .

13. a. Describe the production of nanoparticles using supercritical fluid technology.

**OR**

b. Write a note on the solid state synthesis of nanoparticles.

14. a. List out the applications of nanotechnology in textile industry.

**OR**

b. Give a brief account on nano biosensors.

15. a. Enumerate the role of nanoparticles in cancer therapy.

**OR**

b. Nanomaterials in dentistry – explain.

**SECTION – C**

**ANSWER ANY TWO QUESTIONS**

**(2 x 20 = 40)**

16. Give a detailed account on the various carbon based nanomaterials.

17. Present a detailed account the biogenic and green synthesis of nanoparticles.

18. Write in detail on the contribution of nanotechnology towards bioremediation.

19. Discuss in detail on nanopharmaceuticals.

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