

(6 pages)

Reg. No. :

Code No. : 10027 E Sub. Code : SECH 6 B/
AECH 62

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Sixth Semester

Chemistry

Major Elective – NANO CHEMISTRY

(For those who joined in July 2017 – 2020)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. _____ is a miniaturization technology.
(a) Nano chemistry (b) Nano science
(c) Nano technology (d) Nano materials
2. _____ are believed to have potential in optical electronics because of their ability to change the wavelength of light.
(a) nano wires (b) quantum dots
(c) quantum wells (d) nano crystals

3. In the area of machining and tooling _____ coatings are widely used to increase the life and productivity of production tools.
(a) PVD (b) SMAD
(c) Chemical (d) Reduction
4. The sol-gel process refers broadly to room temperature solution routes for preparing _____ materials.
(a) Carbonate (b) Oxide
(c) Ceramic (d) Fluoride
5. Chemisorption involves only _____ formation.
(a) monolayer (b) bilayer
(c) multilayer (d) none of these
6. Fullerenes are the crystalline form of _____.
(a) Carbon (b) Boron
(c) Silicon (d) Iron
7. Whiskeos are _____.
(a) Carbon nanotubes (b) Carbon fibers
(c) Metal composites (d) None of these



8. For proper dispersion of clay with polypropylene _____ propylene is commonly used.

- (a) Maleic acid
- (b) Maleic anhydride
- (c) Oxalic acid
- (d) Oxalate

9. Dynabeads are used in _____.

- (a) Implants
- (b) Vivo-imaging
- (c) Blood purification
- (d) Surgery

10. _____ can be constructed at the nanoscale make catalysts cost effective.

- (a) Fuel cell
- (b) Catalyst
- (c) Battery
- (d) Capacitors

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What are the factors responsible for the special properties of nanomaterials?

Or

(b) Explain :

- (i) Quantum wells
- (ii) Nano wires.

12. (a) Write short notes on solvated metal atom dispersion (SMAD).

Or

(b) Explain the Gas condensation method.

13. (a) Discuss the limitations of Langmuir theory.

Or

(b) What are the conventional synthetic techniques for preparing nanocatalyst?

14. (a) Discuss the applications of carbon nanotubes.

Or

(b) Explain the polypropylene clay nano composite.

15. (a) What is SEM? Explain the different types of images produced by SEM.

Or

(b) Discuss the applications of nanomaterials in drug delivery.



PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) (i) Define the terms (1) Nano science
(2) Nano technology.
(ii) Significance of Nanoscale.

Or

- (b) Explain the bottom up and top down approaches.
17. (a) Explain (i) Laser ablation method (ii) Sono chemical method.

Or

- (b) Write notes on :
(i) Physical vapour deposition
(ii) Precipitation method.
18. (a) Discuss the surface characterization technique of nano catalyst.

Or

- (b) Explain the structure and properties of graphite.

Page 5 Code No. : 10027 E

19. (a) Discuss in detail the metal nano composite.

Or

- (b) Explain the mechanical and electrical properties of nanocomposite materials.
20. (a) (i) Discuss the applications of nano materials in chemical industry.
(ii) Explain the sunscreen and cosmetics in few words.

Or

- (b) Discuss the characterization of nano materials in IR and Raman Spectroscopy.

Page 6 Code No. : 10027 E

