

(6 pages)

Reg. No. :

Code No. : 20342 E Sub. Code : CECH 62

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2025.

Sixth Semester

Chemistry

Major Elective — NANO CHEMISTRY

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The quantum wire is _____ dimensional.
(a) one (b) two
(c) three (d) zero
2. Diamond is a _____.
(a) nano dot (b) nano cluster
(c) graphite (d) nano tube

3. In sonochemical method the molecules undergo chemical reaction under the influence of _____.
(a) heat (b) light
(c) pressure (d) ultrasound
4. Which of the following is top-down approach?
(a) vapour deposition (b) crystal growth
(c) ball milling (d) sol-gel formation
5. The diameter range of single walled carbon nanotubes
(a) 2 nm (b) 20 nm
(c) 50 nm (d) 60 nm
6. TEM is a _____.
(a) light emitting device
(b) solar device
(c) printing device
(d) magnifying device

7. The material used in the diagnosis of cancer
- (a) Cd Se nanoparticles
 - (b) Li nanoparticles
 - (c) Iodine
 - (d) Copper oxide
8. The main purpose of CNTs in fuel cells is _____.
- (a) Production of energy
 - (b) Active medium
 - (c) Catalyst
 - (d) Storage
9. Identify a chalcogenide material from the following
- (a) ZnO
 - (b) TiO₂
 - (c) ZrO₂
 - (d) ZnS
10. ZnO is a _____ material.
- (a) insulator
 - (b) conductor
 - (c) semi-conductor
 - (d) super conductor

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) What is surface to volume ratio? Explain.
- Or
- (b) Give the specific properties of nano composites.
12. (a) Discuss the role of sol-gel method in the synthesis of nanoparticles.
- Or
- (b) Discuss the role of precipitation method for the synthesis of nano particles.
13. (a) Explain the role of UV-visible spectroscopy in the band gap analysis.
- Or
- (b) Write and explain any one surface characterization technique for nanomaterials.

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14. (a) Explain the sensor applications of nanomaterials.

Or

(b) Discuss the application of nano materials in the treatment of cancer.

15. (a) Give the properties of fullerene.

Or

(b) Discuss the applications of clay nanocomposites.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Give the optical and electrical properties of nanoparticles.

Or

(b) Discuss the classification of nanoparticles based on their dimension.

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17. (a) Explain any two physical methods for the synthesis of nano particles.

Or

(b) Discuss green synthesis of nano particles.

18. (a) Summarize the applications of XRD.

Or

(b) Discuss the role of EDXS in elemental analysis.

19. (a) Give the catalytic applications of nanomaterials.

Or

(b) Describe the applications of nanocomposites.

20. (a) Write the properties of single and multi walled carbon nanotubes.

Or

(b) Write the preparation, properties and applications of ZrO₂.

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