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Reg. No. :

**Code No. : 30303 E Sub. Code : JMCH 6 B/
SECH 6 B**

B.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2020.

Sixth Semester

Chemistry – Main

Major Elective – III — NANO CHEMISTRY

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. 1 nanometre = _____.

(a) 1×10^{-9} m

(b) 1×10^{-10} m

(c) 1×10^{-9} cm

(d) 1×10^{-10} cm

2. The size of quantum dot is —————.
- (a) 2 – 10 cm (b) 2 – 10 mm
(c) 2 – 10 m (d) 2 – 10 nm
3. Which of the following is a physical method for the synthesis of nanoparticles?
- (a) laser ablation
(b) thermolysis
(c) sonochemical methods
(d) reduction methods
4. Sol-gel method is ————— approaches.
- (a) bottom-up (b) top-down
(c) oxidation (d) reduction
5. Fullerene is made up of ————— carbon atom.
- (a) 2 (b) 6
(c) 16 (d) 60
6. ————— is a not a good conductor of electricity.
- (a) graphite (b) diamond
(c) NaCl (d) KCl

7. Which of the following does not combine with fibre to give nano composites?
- (a) metals (b) ceramics
(c) non-metals (d) polymers
8. Carbon nanotubes are the sheets of graphite about _____ in thickness.
- (a) 0.4 cm (b) 0.4 mm
(c) 0.4 nm (d) 40 nm
9. The nano particles from iron and pallodium are used to produce
- (a) Magnets
(b) Magnetic lens
(c) Magneto meters
(d) Magnetic storage devices
10. Nano particles target the _____ causing cells and remove them from blood.
- (a) tumour (b) fever
(c) infection (d) blood

PART B — ($5 \times 5 = 25$ marks)

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

Each answer should not exceed 250 words.

11. (a) What is nanotechnology? Give the significance of nanoscale.

Or

- (b) Define : Quantum wires and quantum dots.

12. (a) Explain Sol-gel method for the synthesis of nano particles.

Or

- (b) How will you synthesis nanosized semiconductor?

13. (a) Explain the theory of adsorption.

Or

- (b) Discuss any one method for the preparation of nano catalyst.

14. (a) Write different types of nanocomposite materials with example.

Or

- (b) Give the applications of nanotubes.

15. (a) Write the application of IR spectra in the study of nanoparticles.

Or

- (b) Write note on : Fuel cells and nano batteries.

PART C — ($5 \times 8 = 40$ marks)

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

Each answer should not exceed 600 words.

16. (a) Give the structure of different types of nanomaterials.

Or

- (b) Describe bottom-up approach for the synthesis of nano particles.

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

Or

- (b) Write note on :
(i) Gas condensation method
(ii) PVD method

18. (a) What are Fullerenes? Give their structure and properties.

Or

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

19. (a) Write the chemical and electrical properties of nanocomposites.

Or

- (b) Write note on :

(i) Natural nano composites

(ii) Carbon fibres

20. (a) Describe the application of TEM in characterisation of nanoparticles.

Or

- (b) Give the current applications of nanoparticles.
