

Your Roll No. :-----

DEPARTMENT OF CHEMISTRY, SCLS
M.Sc. PROGRAM IN CHEMISTRY
SEMESTER-IV EXAMINATIONS-2022
PAPER CODE: MCHCOE-407
PAPER TITLE: CHEMISTRY OF NANOSCIENCE

(Write your Roll No. at the top immediately on receipt of this question paper)

Time: Three Hours

Maximum Marks: 75

Q1. Attempt all Question

- i) The cathode of transmission electron microscope consists of a _____
a) Tungsten wire
b) Bulb
c) Iron filament
d) Gold wire
- ii) Optical tweezers
a) Are used to remove facial hair with miniaturized laser beams
b) Use light to manipulate particles as small as a single atom
c) Are a nanotechnology-based tool for stamp collectors
d) All of the above
- iii) On what factors do the intensity of secondary electrons depend upon?
a) Shape of the irradiated object
b) Chemical composition of the irradiated object
c) Number of electrons ejected
d) Size and chemical composition of the irradiated object, number of electrons ejected, and on the number of electrons reabsorbed by surrounding
- iv) As dendrimers have high surface functionality, so they tend to be -----soluble than linear polymers
a) more
b) less
c) equally
d) very less
- v) Liposomes phospholipid undergoes
a) Oxidation
b) hydrolysis
c) acetylation
d) both a) and b)
- vi) Hydrogels consists of _____ functional groups
a) Hydrophilic
b) Hydrophobic
c) Polar
d) positively charged

- vii) Micelles behave as colloids only when?
 - a) Concentration is less than CMC
 - b) Concentration is equal to CMC
 - c) Concentration is greater than CMC
 - d) They always behave as colloids
- viii) Which nanoparticle has major antibacterial activity
 - a) Gold
 - b) Aluminum
 - c) Silver
 - d) Titanium
- ix) Which nanoparticle can be used instead of antibiotics?
 - a) Organic nanoparticle
 - b) Metal oxide nanoparticle
 - c) Carbon nanoparticle
 - d) Oxide nanoparticle
- x) Cytokinesis is a cell division
 - a) True
 - b) False
- xi) Quantum dots can be used in
 - a) Crystallography
 - b) Optoelectronics
 - c) Mechanics
 - d) quantum physics
- xii) What is the colour of unaggregated gold nanoparticles?
 - a) Purple
 - b) Brown
 - c) Red
 - d) Black
- xiii) Fullerenes are,
 - a) Bionanomaterials
 - b) Carbon based Carriers
 - c) Polymers
 - d) Dendrimers
- xiv) Tiny semiconducting nanoparticles with fascinating light-emitting properties are called
 - a) Nanoparticle
 - b) Nanopores
 - c) Buckyballs
 - d) quantum dots
- xv) Buckyballs are made up of
 - a) Nickel
 - b) DNA
 - c) RNA
 - d) Carbon

1. Attempt any Three of the following

3 X 5=15

- A. Explain the net sketch of TEM
- B. What is a drug delivery system? Explain in details
- C. What is nanoparticle tagging and molecular detection?
- D. What is the role of nanotechnology in diagnostics?
- E. Write short notes on optical tweezers

2. Attempt any Three of the following

3 X 5=15

- A. Explain the net sketch of SEM
- B. Explain how nanoparticles used as drug carriers in polymeric micelles
- C. Discusses the mechanism of antibody coating using nanosphere and nanohybrids
- D. Write short notes on Quantum dots and magnetic nanoparticles
- E. Justify the use of nanotubes in cell imaging

4. Attempt any Three of the following

3 X 5=15

- A. Explain net sketch of scanning probe microscopy
- B. What is hydrogel?
- C. Why nanocontainer technology is important?
- D. Sketch the mechanism of gold nanoparticles for drug discovery
- E. What are the advantages of QDs for drug delivery

5. Attempt any Three of the following

3 X 5=15

- A. Discuss and explain lithograph technique using top- down method
- B. How are dendrimers used in drug delivery system?
- C. What is the development of nanomedicine
- D. List the advantages of nanomedicine
- E. Give the road map of future direction of drug discovery
