

2022

M.Sc.

2nd Semester Examination (CCAЕ)

CHEMISTRY

PAPER—СЕМ-204

**NANOTECHNOLOGY: PRINCIPLES
AND PRACTICES**

Full Marks : 40

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group—A

Answer any four questions. 4×2

1. In which product Tris-Biphenyl Triazine (nano) is used? Why?
2. What are the uses of Nanoliposomes in cosmetics?

(Turn Over)

3. What is the function of Methylene bis-benzotriazolyltetramethylbutylphenol (nano)?
4. How Solid Lipid Nanoparticles (SLN) are act in skin care product?
5. Define coercivity.
6. Graphically show the size dependence of a property number of atoms (x) in the nano dimension.

Group—B

Answer any *four* questions.

4×4

7. What are the advantages and disadvantages of w/o microemulsion technique in the synthesis of otherwise water insoluble inorganic material?
8. Write a short note on the Coulomb-staircase behaviour in the I-V plot of the nanoparticle.
9. Why Nano-silver particles are used in anti bacterial fabrics?
10. Why Silica nano particles have attracted interest from cosmetic industry?

11. What are advantages of nanomaterials-based cosmetics?
12. How is nanoparticle used for modulation of skin colour? Explain with an example.

Group—C

Answer any *two* questions. 2×8

13. (a) Which nano particle is used to cure dental caries and periodontal diseases? How it work?
- (b) Write down the benefits of the use of nanoparticles in cosmetics. 4+4
14. (a) Why do we want to use nano fertilizer? How can we prepare nano fertilizer? What are the advantages of use of nano fertilizer over normal fertilizer?
- (b) Why Nanofiltration is used for the purification of water? 1+2+3+2
15. (a) How nanoparticle are applied for food packaging? How new developments in nanoscience and nanotechnology will allow more control and have the potential of increased benefits? What is a smart package?

(b) What are Smart drugs? How does it work?

2+2+2+2

16. (a) Write notes on the following reduction method for the synthesis of nanoparticle corohydride reduction, citrate reduction, alcohol reduction, solvothermal method.

(b) How could you measure the band gap of nanocolloidal dispersion by optical method?

4+4