

AF-103

April-2016

B.Sc., Sem.-VI

**Elective – 311 : Chemistry
(Nanomaterials and Nanotechnology)**

Time : 3 Hours]

[Max. Marks : 70

- Instructions :** (1) All questions carry equal marks.
(2) Figures to the right indicate marks.

- 1 (a) Write a short note on magnetic properties of nano particles. 7
OR
Explain the solution phase reduction process to make metal nano particles.
(b) Discuss self Assembly of nano particles using inorganic molecules. 7
OR
Write a short note on Sol - Gel method for nanomaterials.
2. (a) Write a note on Graphene. 7
OR
Write a short note on the purification of fullerenes.
(b) What are nanofibers ? Explain its application. 7
OR
Explain the terms :
(i) Quantum wells
(ii) Quantum wires
3. (a) Describe optical microscope with diagram. 7
OR
Explain transmission electron microscope with diagram.
(b) Describe importance of electron spectroscopy for chemical analysis technique. 7
OR
What is X-ray diffraction ? Explain diffraction from nanoparticles.

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4. (a) Describe the application of nano technology in Electronics.

OR

Write the application of nano technology in biotechnology field and medical field.

- (b) Write a short note on special architecture polymers.

OR

Write the importance of nano materials in the field of solar energy.

5. Answer the following question in shorts.

- (1) What is sputtering ?
- (2) Write one use of Laser vaporization.
- (3) Give definition of nanotechnology.
- (4) Which materials use in carbon nanotube except carbon ?
- (5) Write the full form of MWCNT's.
- (6) Give value of angle θ and chirality for Helical CNT.
- (7) Who has invented Auger electron and When ?
- (8) Write the full form of SEM.
- (9) Describe the principle of Confocal microscope.
- (10) Which is the main source to get solar energy ?
- (11) Which metal's nano particles are used in refrigerators and air conditioners ?
- (12) Why can be used nano technology in defense field ?
- (13) Who is called the 'Father of nano technology ?
- (14) What is the diameter of carbon nanotube ?