

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86  
(For candidates admitted from the academic year 2011-12 & thereafter)

SUBJECT CODE: 11CH/PE/NC44

M. Sc. DEGREE EXAMINATION, APRIL 2016  
BRANCH IV- CHEMISTRY  
FOURTH SEMESTER

REG.NO .....

COURSE : ELECTIVE  
PAPER : NANO CHEMISTRY  
TIME : 30 MINUTES

MAX. MARKS: 20

SECTION – A

TO BE ANSWERED ON THE QUESTION PAPER ITSELF

Answer all the questions.

(20 x 1= 20)

I. Choose the correct answer:

- Pick out natural nanomaterial from the following  
[a] skin [b] claw [c] hair [d] all the above
- A technique useful to produce nanotube is  
[a] TEM [b] CVD [c] SEM [d] STM
- Nano phase materials synthesized by  
[a] top down approach [b] bottom up approach  
[c] top down approach and bottom up approach [d] none of the above
- The emission source of TEM is \_\_\_\_\_ filament.  
[a] iron [b] nickel [c] zinc [d] tungsten

II. Fill in the blanks:

- Fullerenes are a class of allotropes of \_\_\_\_\_.
- \_\_\_\_\_ law was used to explain the X – ray diffraction.
- One nano meter is \_\_\_\_\_ meter.
- Nanofibres are fibres with diameter less than \_\_\_\_\_ nano meters.

III. State whether True or False:

- AFM is one kind of scanning probe microscope.
- Sol-gel processing is a wet chemical synthesis.
- Inert gas condensation is top-down process.
- Nano fibres are also used in medical application.

**IV. Match the following:**

- |                                |  |
|--------------------------------|--|
| 13. Soft lithography           | [a] montmorillonit                               |
| 14. Electro deposition         | [b] three dimensional surface profile            |
| 15. AFM                        | [c] relay on printing and molding                |
| 16. First nano clay discovered | [d] metallic nanomaterial with controlled shape. |

**V. Answer in one or two lines:**

17. Define nanotechnology.
18. What do you understand by PVD?
19. What is XRD?
20. Explain the principle of SEM.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86**  
**(For candidates admitted from the academic year 2011-12 & thereafter)**

**SUBJECT CODE: 11CH/PE/ NC44**

**M. Sc. DEGREE EXAMINATION, APRIL 2016**  
**BRANCH IV- CHEMISTRY**  
**FOURTH SEMESTER**

**COURSE : ELECTIVE**  
**PAPER : NANO CHEMISTRY**  
**TIME : 2 ½ HOURS**

**MAX. MARKS: 80**

**SECTION – B**

**I Answer any Five Questions: (5 x 8 = 40)**

1. Classify nanomaterial with its applications.
2. Write a note on nano-wires and nano-machines.
3. Explain kinetic and thermodynamic features of nano materials.
4. Write a note on CVD method.
5. Discuss the surface Plasmon resonance and its applications.
6. Explain the technique used in the synthesis of pure silver nano material.
7. Write the social implication of nanoscience and technology.

**SECTION - C**

**II Answer any Two Questions: (2 x 20 = 40)**

8. (a) Describe the mechanical, electrical, optical and magnetic properties of carbon nanotubes.  
(b) How will you synthesize nanophase materials by inert gas condensation method?  
[10+10]
9. (a) Explain briefly the characteristics of Self Assembled monolayers.  
(b) Explain the instrumentation of AFM and its use in structure determination.  
[10 + 10]
10. (a) Discuss the classification of nanocomposites with examples.  
(b) What is the basic principle in scanning electron microscope? How are they different from Optical Microscopy – Explain.  
[10 + 10]

★ ★ ★ ★ ★ ★ ★ ★

