

**M.R.G ARTS COLLEGE MANNARGUDI.**  
**DEPARTMENT OF PHYSICS**  
**MODEL EXAMINATION 2018 NANOPHYSICS**

Time: 3 hour

Maximum:75 marks

**PART A: ANSWER ALL THE QUESTIONS (10x2 =20 Marks)**

1. What are 3D nanostructure materials?
2. Name few bottom up approaches.
3. List few peculiar properties of CNT.
4. How is CNT used as chemical sensors?
5. What is lithography?
6. What are zeolite cages?
7. What is Abbey criterion?
8. Give the basic principle of electron microscopy.
9. What are CNT emitters?
10. What are Plasmon waveguides?

**PART B: ANSWER ALL THE QUESTIONS (5x5 =25 Marks)**

- 11(a) Write a note on top down approach.(or)  
(b) Describe Quantum well.
12. (a) Explain superconductivity in  $C_{60}$ .(or)  
(b) Discuss the applications of CNT
13. (a) Describe the synthesis of nanooxides by sol gel technique.(or)  
(b) Explain in detail photolithography.
14. (a) Briefly discuss working of STM.(or)  
(b) Explain the working of SPM
15. (a) Describe nanorobots.(or)  
(b) Write a note on photonic crystals.

**PART C: ANSWER ANY THREE QUESTIONS (3x10 =30 Marks)**

16. What are quantum dots? Describe exciton confinement in quantum dots
17. Explain the electrical and mechanical properties of CNT.
18. Explain Langmuir Blodgett films preparations.
19. Discuss the principle construction and working of SEM.
20. Write short notes on
  - (a) Biological applications of nanopracticals.
  - (b) Membrane based water purification.

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DEPARTMENT OF PHYSICS

M.Sc II Year MODEL EXAMINATION MARCH 2019

NANO PHYSICS P 16 PYE 5

TIME: 3 Hrs

Max.Marks:75

PART A: ANSWER ALL THE QUESTIONS (10x2 =20 Marks)

1. List few top down approaches.
2. What are excitons?
3. What are fullerence?
4. List the applications CNT.
5. What is electro spinning?
6. What are zeolite cages?
7. State the principle of AFM.
8. List the demerits of TEM.
9. What is Plasmon wave guide?
10. What are photonic crystals?

PART B: ANSWER ALL THE QUESTIONS (5x5 =25 Marks)

11. Write a note on exciton confinement in quantum dots.(OR)  
Explain the kinetic stability of nanoparticles.
12. Show that superconductivity in  $C_{60}$ .(OR)  
Explain electrical and mechanical properties of CNT.
13. Explain the sol gel process .(OR)  
Describe electro chemical process.
14. Describe the working of SEM.(OR)  
Describe the working of STM.
15. Write a note on nonorobots.(OR)  
Explain the biological applications of nanoparticles.

PART C: ANSWER ANY THREE QUESTIONS (3x10 =30 Marks)

16. Explain with illustration Top down and Bottom up approaches.
17. Discuss the fabrication and structure of CNT.
18. Explain any two lithographic techniques.
19. Explain the principle and working of TEM.
20. Discuss molecular and nano electronics.

M.R.GOVERNMENT ARTS COLLEGE MANNARGUDI

DEPARTMENT OF PHYSICS

M.Sc II Year MODEL EXAMINATION MARCH 2020

NANO PHYSICS P 16 PYE 5

TIME: 3 Hrs

Max.Marks:75

PART A: ANSWER ALL THE QUESTIONS (10x2 =20 Marks)

1. What is nano technology?
2. What is Quantum wire?
3. Explain the bonding in Carbon?
4. When will carbon become a superconductor?
5. List few types of lithography?
6. What is the principle of electrochemical deposition?
7. State the principle of SPM.
8. What are the three different operational modes of STM?
9. What is SERS?
10. What is the concept of nano mechanics?

PART B: ANSWER ALL THE QUESTIONS (5x5 =25 Marks)

11. ) Explain top down and bottom up approaches ?(OR)  
Explain quantum dots and exciton confinement in quantum dots.
12. Explain the structure and properties of C<sub>60</sub>.(OR)  
Explain the applications of CNT.
13. Explain Zeolite Cages .(OR)  
What are organic and inorganic hybrids?
14. Describe the working of SPM.(OR)  
Describe the working of STM.
15. Write a note on Plasmon waveguides.(OR)  
Explain the band gap engineered quantum devices.

PART C: ANSWER ANY THREE QUESTIONS (3x10 =30 Marks)

16. Explain 1D, 2D and 3D nano structured materials.
17. Discuss the fabrication and structure of CNT.
18. Explain atomic layer deposition.
19. Explain the principle and working of SEM.
20. Describe CNT emitters and gold nanocatalysts.