LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **PHYSICS**

FOURTH SEMESTER – **APRIL 2016**

PH 4958 – NANO SCIENCE

Date: 27-04-2016 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART-A

Answer **ALL** questions (10x2=20 marks)

1. How nanotechnology plays vital role in nature?
2. Write a short note on size dependent properties of nano materials.
3. What is Quantum confinement effect?
4. How super para magnetic materials act as magnetic bio-materials?
5. How is TiO_2 helpful in cleaning air?
6. Write a short note on Richard Feynman's quote on nanotechnology.
7. How do you determine the size of nano particles?
8. What is Quantum computing?
9. Draw a flowchart for solvothermal synthesis of nano materials.
10. Bring out the significance of X-ray photo electron spectroscopy in characterization of nano materials?

PART-B

Answer any FOUR questions (4x7.5=30 marks)

11. With a neat sketch explain electronic structure of nanomaterials.
12. How semiconductor quantum dots are used in design of photonic devices?
13. Describe the working principle of scanning microscopy analysis.
14. Discuss the various step involved in LB method.
15. Write a short note on electrochemical sensors?

PART-C

Answer any FOUR questions (4x12.5=50 marks)

16. Outline the application of Nanotechnology in a) Catalysis b) Filtration. c) Energy d) Information and communication and e) Heavy Industry.
17. Explain optical properties of carbon nano structures.
18. Write short note on the principle, types and growth mechanism of CVD method.
19. Draw the schematic structure of a TEM and explain the working along with its use in analyzing the nanoparticles.
20. Explain how wave guides are used in telecommunication?

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