

R13

Code No: 118CJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech IV Year II Semester Examinations, April - 2018****INTRODUCTION TO NANOTECHNOLOGY****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Write any two applications of nanotechnology?
- b) What is the significance of nanotechnology in day to day life?
- c) What is dislocation in nano crystalline materials?
- d) Write briefly about optical properties of nanomaterials.
- e) What is Chemical Vapor Deposition?
- f) Write briefly about Inert gas condensation.
- g) Write any two differences between TEM and FEM.
- h) Write briefly about Field ion microscope.
- i) What is the role of MEMS in medical field?
- j) Write briefly about significance of Nanocrystals.

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PART - B**(50 Marks)**

2. Write in detail about evolution and future scope of Nanotechnology. [10]
- OR**
3. What is Biomimicking? Write in detail about it with the help of any two examples. [10]
4. Write in detail about effect of Nano dimensions on Material behavior. [10]
- OR**
- 5.a) Write briefly about how mechanical properties will get effected at nano-dimensions. [5+5]
b) Write briefly about grain boundaries in Nano crystalline materials.
6. Write in detail about Molecular Beam Epitaxy with the help of a neat schematic diagram. [10]
- OR**
- 7.a) Write briefly about self assembly.
b) Write briefly about spark plasma sintering. [5+5]

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8. Write in detail about principle and operation of Atomic force microscope. [10]

OR

- 9.a) Write briefly about Principle of Three dimensional atom probe.

- b) Write briefly about Principle of Small angle X-ray scattering. [5+5]

- 10.a) What are nanosensors? Write in detail about nano sensors with the help of two examples?

- b) Write defense and space applications of Nanotechnology. [5+5]

OR

11. Write in detail about role of nanotechnology in medical applications. [10]

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