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Reg. No. : | | | | | | | | | | |

Question Paper Code: 99919

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Elective

Electronics and Communication Engineering

19UEC919– Nano Electronics

(Regulations 2019)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Nanotechnology refers to the fabrication and application of entities whose feature sizes are in which of the following ranges : CO1-U

   (a) 0.1 nm-10 nm (b) 1 nm-100 nm (c) 100 nm-1000 nm (d) 1000-10000nm

2. Which of the following is used to make both nano-particles and nano-powders CO2-U

   (a) Chemical vapour deposition (b)Sol-gel technique

   (c) Plasma arching (d) Electro deposition

3. Most nanostructures are _____ CO2-U

   (a) crystalline (b) quantum dots (c) poly crystalline (d) nanoparticle

4. Graphene is a _____ CO1- U

   (a) 0-Dimensional (b) 1-Dimensional (c) 2-Dimensional (d) 3-Dimensional

5. Spintronic devices are used in the field of _____ CO2- U

   (a) No-Storage devices (b) Mass storage devices

   (c) Heating devices (d) none of the above

PART – B (5 x 3= 15 Marks)

6. Mention the applications of Nano materials with few examples. CO1- U
7. How will you characterize Nano devices from electron devices? CO2- U
8. Write short notes on microscopy with neat diagram. CO2- U
9. Mention the procedure to put the other atoms between the plates of Graphitic sheets. CO2- U

10. Write the use of 'Nanobot'. CO2- U

PART – C (5 x 16= 80 Marks)

11. (a) Explain in detail about the classification of Nano material with neat diagram. CO1- U (16)

Or

(b) Classify the materials based on its energy band structures. Also Explain in detail about Excitons and Mobility. CO1- U (16)

12. (a) Analyze any two synthesis methods for preparation of nano material from bulk material to identify the suitable method for nano particle preparation. Justify your answers CO5- App (16)

Or

(b) Analyze any two synthesis methods for preparation of bulk material from nano material to identify the suitable method for bulk material preparation. Justify your answers CO5- App (16)

13. (a) Analyze the Microscopic technique that can be used to study about crystal structure and their properties. Justify your answer. CO3- App (16)

Or

(b) Apply the concept of X-Ray diffraction technique in the characterization of Nano particles. CO3- App (16)

14. (a) Explain the principle of carbon nano tube with its properties. CO2- U (16)

Or

(b) Explain in detail about the applications of Carbon Nano tubes with examples. CO2- U (16)

15. (a) Explain the concept of nano-biosensors and smart dust? CO2- U (16)

Or

(b) Illustrate the principle of Molecular and Supra molecular switches with suitable diagram and compare its results? CO2- U (16)