**A** **Reg. No. :** | | | | | | | | | | |

**Question Paper Code: 59419**

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Electronics and Communication Engineering

15UEC919 - NANOELECTRONICS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10x 1 = 10 Marks)

1. Microwaves or Radar waves can provide useful information about materials when employed under _____ conditions in the absence of an applied magnetic field. CO1- R

   (a) resonant (b) nonresonant

   (c) supermolecular (d) narrowband

2. X-ray diffraction fails to detect the presence of substances: CO1- U

   (a) comprising elements with two or more isotopes.

   (b) comprising less than 5 percent of a mixture.

   (c) containing a magnetic field.

   (d) containing a high concentration of carbon.

3. The particles having a radius of about _____, can be considered to be nanoparticles CO2- R

   (a) $\geq$ 100Å (b) $\leq$ 100 Å (c) $\geq$ 1000 Å (d) $\leq$ 1000 Å

4. In a nanotube, carbon atoms are arranged in the shape of CO2- U

   (a) hollow cylinder (b) a geodesic dome (c) a crystal (d) flat players

5. Many OFETs are now designed based on the thin-film transistor (TFT) model, which allows the devices to use _____ materials in their design. CO3- R

   (a) less conductive (b) highly conductive (c) more energy (d) more power

6. Which ratio is constant for DNA? CO3- R

(a) A+G/T+C (b) A+C/T+G (c) A+C/U+G (d) A+U/C+G

7. The full form of STM is. CO4- U

(a) Scanning Tunneling Microscope (b) Scientific Technical Microscope

(c) Systematic Technical Microscope (d) Super Tensile Microscope

8. In below, which is not a nonofillers? CO4- R

(a) Silicas (b) Clays (c)Silicon (d) Carbon blacks

9. Nano particles of which atom are used to control collateral damage due to explosion? CO5- A

(a) Copper (b) Aluminium (c) Carbon (d) Lead

10. Quantum dots are also referred to _____. CO5- R

(a) Solar cells (b) Artificial atoms

(c) Self-assembled monolayers (d) Nanowires

PART – B (5 x 2= 10Marks)

11. Compare Crystallography and Microscopy. CO1- U

12. How carbon nanotube based interconnects is used in computer chips? CO2- U

13. What are the advantages of OLEDs over flat panel displays? CO3- U

14. Write the typical process of photolithography. CO4- U

15. What are quantum dots? CO5- U

PART – C (5 x 16= 80Marks)

16. (a) Explain in detail about Transmission Electron Microscopy. CO1-U (16)

Or

(b) Expalin in detail about Raman Spectroscopy with its sampling techniques? CO1 -U (16)

17. (a) Explain various properties of Carbon nanotubes. CO2 -App (16)

Or

(b) Discuss in detial about different properties of individual nano particles? CO2 -App (16)

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| 18. | (a) | Explain in detail about OFETs. | CO3- U | (16) |
| | | Or | | |
| | (b) | What is OLED? Expalin the working principles of OLED with neat sketches? | CO3- U | (16) |
| 19. | (a) | Explain in detail about photolithography in product design and development process of Nanodevices. | CO4-U | (16) |
| | | Or | | |
| | (b) | Discuss in detail about nano product forms? | CO4 -U | (16) |
| 20. | (a) | (i) Write short notes on CVD? | CO5- U | (8) |
| | | (ii) Briefy discuss about Microstrip Patch Antenna? | CO5- U | (8) |
| | | Or | | |
| | (b) | Explain in detail about Photonic band Gap Antenna. | CO5- U | (16) |