

R09

Code No: 56014

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, November/December - 2020

NANO TECHNOLOGY

(Common to ME, ECE, AE)

Time: 2 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) Why rain water droplet have only spherical shape? Why can't it be a cube? Explain the phenomenon and justify your answer utilizing the surface energy concept.
- b) Explain briefly magnetic and optical properties of nanomaterials. [8+7]
- 2.a) What do you mean by quantum dot? Explain the quantum confinement concept.
- b) In what way electrical and optical properties of nanomaterials are connected? Explain briefly. [8+7]
- 3.a) What do you mean by Fullerenes? Explain the properties in detail.
- b) Explain electrical and optical properties of CNTs briefly. [8+7]
- 4.a) Discuss briefly Inert gas condensation technique of fabrication of nanomaterials.
- b) What is Chemical Vapor Deposition (CVD)? Explain different types of CVD processes briefly. [8+7]
5. What is Bragg's Law? Explain the working principle of XRD. [15]
- 6.a) What do you mean by core-shell particles? What are the advantages of these type of nanoparticles? Explain briefly with examples.
- b) What do you mean by Lab on chip? Explain briefly for bio analysis. [9+6]
- 7.a) Discuss in detail about tunneling magneto resistance.
- b) What do you mean by single electron tunneling? Discuss briefly. [7+8]
8. Write short notes on the following:
- a) Deep UV lithography
- b) e-beam lithography. [7+8]

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