

Code No: **RT41036****R13****Set No. 1****IV B.Tech I Semester Supplementary Examinations, February/March - 2018****NANO TECHNOLOGY****(Open Elective)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B************PART-A (22 Marks)**

1. a) Distinguish between nanoscience and nanotechnology. [4]
b) Explain the typical electrical properties of nanomaterials. [4]
c) What are the advantages of bottom-up synthesis methods? [4]
d) Write about the principle of AFM. [3]
e) What are the unique characteristics of carbon nanotubes? [4]
f) Explain the carbon allotropes. [3]

PART-B (3×16 = 48 Marks)

2. a) Explain why the materials change their behavior at nano level. [8]
b) What could be the futuristic applications of nanotechnology? [8]
3. Write about the mechanical properties of nano materials. Make a generic comparison of mechanical properties of carbon nanotubes with those of steel. [16]
4. a) Discuss the principle and applications of sol gel method. [8]
b) What are the requirements for realizing semiconductor nano structures? [8]
5. a) What is the purpose of TEM? Explain its principle. [8]
b) Explain the principle of Raman spectroscopy. [8]
6. a) Discuss the typical properties of graphene. [8]
b) How do you synthesis carbon nanotubes? [8]
7. a) What are the applications of quantum dots? Explain in detail. [8]
b) What are the potential effects of nanomaterials to environment? [8]