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
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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 *(3x16 = 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) Discus 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]