Total No. of Questions : 10]

SEAT No. :

P177

[Total No. of Pages : 2

[5871] - 698
B.E. (Chemical)
NANOTECHNOLOGY
(2015 Pattern) (Semester - II) (Elective - IV)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q.No.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Figures to right indicates full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Assume suitable data, if necessary.***

Q1) a) Write a short note on Diamonded nanostructures? **[5]**

b) List any four applications of buckyballs and carbon nanotubes. **[5]**

OR

Q2) a) Explain the methods used for the synthesis of graphite? **[5]**

b) What are the challenges faced by researchers in nanotechnology. **[5]**

Q3) a) Explain the top-down and bottom-up approaches for the synthesis of nanomaterials. **[5]**

b) Explain pulsed laser deposition with its schematic layout. List its advantages. **[5]**

OR

Q4) a) Explain the principle and operation of the SPM-AFM techniques. **[5]**

b) Explain the working of scanning tunneling microscopy (STM) with a neat sketch? **[5]**

Q5) a) Explain how quantum cryptography is used for secure data communication. **[10]**

b) Explain the Pauli exclusion principle along with the application. **[7]**

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OR

Q6) a) Write a short note on extrinsic semiconductors and intrinsic semiconductors. **[10]**

b) Write down the short note on Quantum Cryptography. **[7]**

Q7) a) Explain electrical phenomena at interfaces Van der Waals forces between colloidal particles. **[10]**

b) What are the factors affecting contact angles and colloidal stability. **[7]**

OR

Q8) a) List the methods for producing carbon nanotubes and explain any of the methods with a neat sketch? **[10]**

b) Write a note on photocatalysis of nanostructured materials? **[7]**

Q9) a) Discuss Nano-biotechnology and explain how nanostructure mediated drug delivery helps in the treatment of various diseases? **[8]**

b) Explain the health and environmental impacts of nanotechnology. **[8]**

OR

Q10)a) Write briefly on the commercial process of nanotechnology and its application in chemical engineering. **[8]**

b) Describe the use of Nano electronics with suitable examples. **[8]**

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