CBCS SCHEME

USN | | | | | | | | | | |

17NT35

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019
Physical and Chemical Principles of Nano Technology

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Derive an expression for uncertainty principle with the help of localization experiment. **(10 Marks)**

b. Write a note on Molecular Orbital theory and its applications. **(10 Marks)**

OR

2 a. Write a note on Valance Bond theory and its applications. **(10 Marks)**

b. State and explain Debroglie hypothesis. **(05 Marks)**

c. State and explain Planck's hypothesis. **(05 Marks)**

Module-2

3 a. Define Thermodynamics. Write a note on importance and limitations of thermodynamics. **(10 Marks)**

b. Write a note on Enthalpy and Heat capacity of a system. **(10 Marks)**

OR

4 a. State and explain the first law of thermodynamics with mathematical expressions. **(10 Marks)**

b. Explain the concept of heat capacity at constant volume and constant pressure. **(06 Marks)**

c. What is Spontaneous process? Write the criteria for spontaneity. **(04 Marks)**

Module-3

5 a. Explain Debye theory of molar heat capacity. Write the limitations. **(10 Marks)**

b. Distinguish between Metal , Insulator and Semiconductor. **(06 Marks)**

c. Explain Brillouin zone. **(04 Marks)**

OR

6 a. Explain Einstein's theory of molar heat capacity. Write the limitations. **(10 Marks)**

b. Discuss the concept of lattice vibrations and lattice waves in a linear mono atomic lattice. **(10 Marks)**

Module-4

7 a. Explain the classification of semiconductors with examples. **(10 Marks)**

b. Explain the construction and working of Tunnel diode with suitable graph. Write uses of Tunnel diode. **(10 Marks)**

OR

8 a. Explain P – N junction semiconductor diode and give its advantages. **(10 Marks)**

b. Write a note on Rectification. **(10 Marks)**

Module-5

9 a. Explain the dynamic properties of colloids. **(10 Marks)**

b. Explain the characteristics and identification of type of emulsions. **(05 Marks)**

c. Explain Crystalloids and Colloids. **(05 Marks)**

OR

10 a. Explain classification of colloids based on state of aggregation of the dispersed phase and dispersed medium with example. **(10 Marks)**

b. Explain Electrophoresis and Electro osmosis. **(08 Marks)**

c. Explain Tyndall effect. **(02 Marks)**

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