Unit – 5

Part – A

1. In a quantum wire the material size isreduced-----.
   (A) 3 directions (B).**2directions** (C). 1 directions (D). 0directions

2. Tensile strength of CNTexceeds----.
   (A) 1KPa (B) 1 MPa **(C) 150 GPa** (D)1TPa

3. Carbon nanotube reactivity is related to-----.
   (A) volume (B) length (C) **diameter** (D)Width

4. In CVD chamber the precursors are introduced to the reaction chamber in the …..state.
   (A) Liquid (B) Solid (C) Gaseous (D)colloidal

5. Nano structures have dimensions in between……
   (A) 1 to 100 Å (B) **1- 100 nm** (C) 100-1000 nm (D) 100- 1000 Å

6. AFM tip should have a radius of curvatureof-----.
   (A) **greater than 20-50 nm** (B) lesser than 20-50 nm (C) around 100nm
   (D) more than 100 nm

7. In a quantum dot the material size is reduced -------.
(A) **3 directions** (B) 2 directions (C) 1 directions (D) 0directions

8. Electrons are caused by the de-energization of the specimen after a secondary electronis produced-----.
(A) **Auger** (B) Bragg (C) Lorenz (D)Kakuchi

9. The physical parameter that is propped in AFM resulting from different interaction is----.
(A) Charge (B**) Force** (C) potential (D)temperature

10. In PVD chamber the precursors are introduced to the reaction chamber in the …..state
    (A) Liquid (B) **Solid** (C) Gaseous (D)semisolid

11. In CVD Chamber, the precursors are introduced to the reaction chamber in the ____ state.
    (A) Liquid (B) Solid (C) **Gaseous** (D)semisolid

12. Nanoparticles are special mainly because of their ____
(A) **Surface area** (B)surface charge (C) volume (D) force

13. Exciton can move freely in two directions only in

(A) **Quantum well** (B) quantum wire (C) quantum dot (D) bulk

14. Bands of alternating light and dark lines that are formed by inelastic scattering interactions that are related to atomic spacings in the specimen are called ____.
(A) Auger bands (B) Bragg bands (C) Lorentz bands (D) **Kakuchi bands**

15. Nanotechnology deals with ___ of nanostructures into useful nanoscale devices such as electronic circuits and mechanical devices at the molecular level
(A) the design (B) manufacturing (C) applications (D) **engineering**

16.The ------- method is generally employed in the system where crystals are not easily obtained.
(A) Rotating crystal (B) Oscillating **(C) Powder Crystal** (D) Fixed Crystal

17.The method which provides information on bond length and angles in the molecule which helps in structure determination--------.
(A) Thermal method **(B) X-ray diffraction method** (C) potentiometric method
(D) Ammperometric method

18. The path difference is an integral multiple of wavelength is called---------.
(A) Bragg law (B) Biotsavart's Law (C) Ohms Law (D) Lambert's law

Part – B

1. Discuss about quantum well, quantum wire and quantumdot.
2. Write the applications ofAFM.
3. Write any four Applications of Powder X-ray diffractionmethod.
4. Write the applications of SEM andTEM.
5. Write a short note on CNT.
6. Write the properties of CNT.
7. Write any four Applications ofCNT.

Part – C

1. Explain the working principle of Scanning Electron Microscopy(SEM).
2. Explain the working principle of Transmission Electron Microscopy(TEM).
3. Write the principle of Atomic Force Microscopy (AFM). Explain basic components and working of AFM. Write the merits, demerits and Applications ofAFM.
4. What is Carbon Nano tube (CNT)? Explain the structure, Type, properties, synthesismethods and applications ofCNT.
5. Explain the Physical Vapour Deposition (PVD) method of materialsynthesis.
6. Explain the Chemical Vapour Deposition (CVD) method of materialsynthesis.
7. What is Nano structured materials (Quantum well, Quantum Dot, and Quantum wire)? Explain the synthesis methods for Nano structured materials. Explain density of state of zero dimension.
8. Explain Powder X-Ray diffraction method and write the applications of Powder XRD?