

**Final Examination on Add-on Course 2021-22**

**Subject: Nano science and nano-materials**

**Department: Physics**

**Time: 45 Min**

**Marks: 50**

<b>Name of the student</b>	
<b>Class Roll Number</b>	
<b>Signature of Invigilator</b>	

**(Each question carries 2 mark and all questions are compulsory. Write the answer option in the box provided)**

Signature of the student after verified the marks

1. Nanomaterials are the materials with at least one dimension measuring less than \_\_\_\_\_

- a) 1 nm
- b) 10 nm
- c) 100 nm
- d) 1000 nm

2. A material with one dimension in Nano range and the other two dimensions are large is called \_\_\_\_\_

- a) Micro-material
- b) Quantum wire
- c) Quantum well
- d) Quantum dot

3. The colour of the nano gold particles is \_\_\_\_\_

- a) Yellow
- b) Orange
- c) Red
- d) Variable

4. The melting point of particles in nano form \_\_\_\_\_

- a) Increases
- b) Decreases
- c) Remains same
- d) Increases then decreases

5. The first talk about nano-technology was given by \_\_\_\_\_

- a) Albert Einstein
- b) Newton
- c) Gordon E. Moore
- d) Richard Feynman

6. The initial tools used to help launch the nanoscience revolution were \_\_\_\_\_

- a) Binoculars
- b) Microscope
- c) Scanning probe instruments
- d) Interferometer

7. Which of the processes of materials was not described as Nanotechnology?

- a) Separation
- b) Creation
- c) Processing
- d) Consolidation

8. The four types of Artificial nanomaterials are \_\_\_\_\_
- a) Carbon-based, non-metallic, composites and ceramics
  - b) Carbon-based, metallic, composites and ceramics
  - c) Carbon-based, non-metallic, composites and dendrimers
  - d) Carbon-based, metallic, composites and dendrimers
9. Solution of pure buckminsterfullerene has a colour of \_\_\_\_\_
- a) Green
  - b) Purple
  - c) Pink
  - d) Yellow
10. Nano sized polymers built from branched units are called \_\_\_\_\_
- a) Dendrimers
  - b) Composites
  - c) Carbon-based materials
  - d) Metal-based materials
11. Which property of nanoparticles provides a driving force for diffusion?
- a) Optical Properties
  - b) High surface area to volume ratio
  - c) Sintering
  - d) There is no such property
12. On both ends of the CNTs, which carbon nanostructure is placed?
- a) Graphite
  - b) Diamond
  - c) C<sub>60</sub>
  - d) Benzene
13. Quantum dots can be used in \_\_\_\_\_
- a) Crystallography
  - b) Optoelectronics
  - c) Mechanics
  - d) Quantum physics
14. Nanoscience can be studied with the help of
- a) Quantum mechanics
  - b) Newtonian mechanics
  - c) Macro dynamics
  - d) Geophysics
15. The four types of Artificial nanomaterials are
- a) carbon-based, non-metallic, composites and ceramics
  - b) carbon-based, metallic, composites and ceramics
  - c) carbon-based, non-metallic, composites and dendrimers
  - d) carbon-based, metallic, composites and dendrimers
16. How many Hydrogen atom lined up in a row would fit in a one nano-meter space?
- a) One
  - b) Seven
  - c) Ten
  - d) Eight

17. As the size of nano particle decreases, surface area

- a) Decreases
- b) Increases
- c) Remain same

18. CVD stands for

- a) Chemical vapour density
- b) Carbon vapour density
- c) Carbon vapour deposition
- d) Chemical vapour deposition

19. What type of precursors are used in sol-gel method?

- a) Metal oxides
- b) Metal fluorides
- c) Metal alkoxides
- d) Metal dioxides

20. Sol-gel method is an example of bottom-up approach

- a) True
- b) False

21. The configuration of Fullerene is

- a) 12 Hexagons and 22 Pentagons
- b) 15 Hexagons and 15 Pentagons
- c) 20 Hexagons and 12 Pentagons
- d) 18 Hexagons and 15 Pentagons

22. The carbon nanotubes have high conductivity

- a) True
- b) False

23. What type structure for metallic nanotubes have?

- a) Armchair
- b) Boat
- c) Chiral
- d) Achiral

24. When semiconductors are reduced to nanometers they become insulators

- a) True
- b) False

25. How many gold atoms lined up in a row would fit in a one nano-meter space?

- a) 3
- b) 3.5
- c) 4
- d) 4.5