

Name:  
Enrolment No:



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, May 2020**

**Course: Nanomaterial Processing and Applications**  
**Program: BT-ME-Spz-MS&NT**  
**Course Code: MTEG 425**

**Semester: VIII**  
**Time 03 hrs.**  
**Max. Marks: 100**

**Instructions:** Attempt all questions, there is an internal choice in Section B and Section C

**SECTION A**

1. Coating the nano-crystals with the ceramics is carried that leads to \_\_\_\_\_
  - a) Corrosion
  - b) Corrosion resistant
  - c) Wear and tear
  - d) Soft
  
2. \_\_\_\_\_ is the field in which the nanoparticles are used with silica coated iron oxide iron oxide.
  - a) Magnetic applications
  - b) Electronics
  - c) Medical diagnosis
  - d) Structural and mechanical materials
  
3. The solvent evolves towards the formation of an inorganic continuous network containing a \_\_\_\_\_
  - a) Gaseous phase
  - b) Gel
  - c) Solid phase
  - d) Semi solid phase
  
4. The optical properties of CNT are due to \_\_\_\_\_ of photoluminescence.
  - a) Absorption
  - b) Emission

- c) Consumption
  - d) Collision
5. To improve the composite of graphite \_\_\_\_\_ is used as catalyst.
- a) CO
  - b) NI
  - c) CO and NI
  - d) TIO
6. For nano metres whose diameters less than \_\_\_\_\_ are used as welding purposes.
- a) 10nm
  - b) 20nm
  - c) 30nm
  - d) 40nm

### **SECTION B**

- 7. Explain nanoparticles, nanotubes, and nanofilms. State the significance of specific surface area of nanoparticles.
- 8. Assess single walled and multi walled carbon nanotubes.
- 9. Describe in detail the significance of FTIR and XRD analysis for nanoparticles characterization.
- 10. Explain different dimensional structures of nanoparticles and the change in mechanical properties of nanoparticles with their change of size.
- 11. Explain Van der Waal and electrostatic forces and their significance in nanostructures and layers.

**OR**

Describe in detail the template assisted method for nanowire synthesis?

### **SECTION C**

- 12. Assess physical vapour deposition (PVD) and chemical vapour deposition (CVD) methods of nano synthesis of films, coatings and their relative merits.

**OR**

Describe in detail the sol-gel processes to prepare nanoparticles of different types like emulsion, aerogel, powder.