Two Marks Questions

1. **What are types of nanomaterials?**

   Zero Dimensional nanomaterials: Nano Clusters, Quantum Dots

   One Dimensional nanomaterials- Nano rods, Nanowires and Nano tubes

2. **List out the properties of carbon nanotubes**

   - CNTs are very strong.
   - It can with stand extreme strain in tension and posses elastic flexibility
   - The atoms in a Nanotube are continuously vibrating back and forth
   - It is highly conducting and behaves like metallic or semiconducting materials
   - It has very high thermal conductivity and kinetic properties

3. **List out the uses of carbon nanotubes.**

   - It is used in battery technology and in industries as catalyst
   - It is also used as light weight shielding materials for protecting electronic equipments
   - CNTs are used effectively inside the body for drug delivery
   - It is used in composites
   - It also act as an efficient catalysts for some chemical reactions
   - It acts as a very good biosensor.
   - It is also used in water softening process as a filter

4. **Write the uses of sol gel method.**

- Sol-gel is a chemical solution process used to make ceramic and glass materials in the form of thin films, fibers or powders .
- Used in health care, cosmetics, food, and special chemicals

5. **Write a note on Biogas**

   - Biogas is a type of biofuel that is naturally produced from the decomposition of organic waste in the absence of oxygen
   - When organic matter, such as food scraps and animal waste, break down in an

anaerobic environment (an environment absent of oxygen) they release a blend of gases called biogas.

- it is a renewable energy source

6. What is Carbonization?

The process of preparing coke from coal is known as carbonization of coal. When bituminous coal is heated strongly in the absence of air, the dense strong, porous mass obtained is called metallurgical coke.

7. List out composition of CNG.

The average composition of CNG is as follows:

Constituents	Percentage %
Methane	88.5
Ethane	5.5
Propane	3.7
Butane	1.8
Pentane	0.5

8. List out composition of LPG.

The average composition of LPG is as follows:

Constituents	Percentage %
n-Butane	38.5
Iso Butane	36.7
Propane	24.7
Others	0.1

9. Write a note on Biodiesel.

A fuel derived from organic oils, such as vegetable oil, rather than petroleum. Biodiesel's use and production are increasing. It's typically used for aircraft, vehicles and as heating oil. It involves treatment of vegetable oil (sunflower oil, palm oil, soya bean oil, mustard oil, etc.) with excess of methanol in the presence of catalyst to give mono ethyl esters of long chain fatty acid(Bio diesel) and glycerin.

10. Define calorific value

The efficiency of a fuel is determined by its calorific value. The calorific value of a fuel is defined as "the total amount of heat liberated by the complete combustion of an unit mass of fuel".

11. Define Gross calorific value

Gross or higher calorific value is defined as the total amount of heat produced, when a unit mass of the fuel is completely burnt and the products of combustion are cooled to room temperature.

12. Define Gross calorific value

The net calorific value is defined as the net heat produced, when a unit mass of the fuel is completely burnt and the products of combustion are allowed to escape.

Net calorific value = Gross calorific value - Latent heat of condensation of water vapour produced