UNIT-V

SUPER CONDUCTORS:

SHORT ANSWER QUESTIONS:

1. Interpret the effect of temperature on normal conductor and super conductor graphically.
2. Explain the effect of magnetic field on super conductors.(critical magnetic field)
3. Explain critical temperature and critical current.
4. What is Meissner effect? Explain.
5. Explain isotope effect.
6. What are Type-I and Type-II super conductors?
7. What are cooper pairs?
8. What is ac and dc Josephson effect?
9. Mention the important properties of a super conductor.
10. What are SQUIDS?
11. Explain the existence of energy gap in super conductors.
12. Explain Cryotrons.
13. Mention any four applications of superconductors.

ESSAY QUESTIONS:

1. Explain the critical parameters and their significance in superconductors.
2. Prove that superconductors are perfect diamagnetic materials.
3. Describe the difference between Type-I and Type-II superconductors. (OR) How the Super conductors are classified and explain their behavior in the presence of magnetic field.
4. What are Cooper pairs? Describe the BCS theory of superconductivity. (OR) What are cooper pairs? Explain how Cooper pairs increase the conductivity of superconductor.
5. Describe ac and dc Josephson effects and their applications.
6. Write notes on applications of superconductors.

NANO MATERIALS:

SHORT ANSWER QUESTIONS:

1. Why surface area to volume ratio is large in nano materials?
2. How does top-down approach is differing from bottom-up approach?
3. Write a short note on Quantum dots.
4. What is nano scale? Explain the significance of nanoscale.
5. What is the size of water molecule, RBC, Human hair in nano meters.
6. Mention any two methods in Top-down approach method.
7. Mention any two methods in Bottom-Up approach method.
8. Mention any four applications of nanomaterials.
9. Why the properties of nanomaterials are different from the bulk materials .
10. Due to which principle of nanomaterial the optical property of nanomaterial is different from bulk.
11. The colour of gold changes when the particle size is reduced to nanoscale. Explain it.
12. What is nanoscale? Explain the significance of nanoscale.
13. Mention any two methods for the characterization of nanomaterials.

ESSAY QUESTIONS:

1. What are Nanomaterials? How they are classified
2. Describe the basic principles of a Nanomaterials. (OR)
   Why the properties of nanomaterials are different from the bulk materials .
3. How are optical, physical and chemical properties of nano particles vary with their size.
4. Discuss the properties of nanomaterials .
5. How are nanomaterials produced? Describe ball milling method along with their advantages and disadvantages.
6. Describe chemical vapour deposition method along with their advantages and disadvantages.
7. Explain how X-ray diffraction can be used to characterize nanoparticles.
8. What is SEM? How it is used to characterize nanoparticles.
9. Mention the important applications of nanomaterials in medicine.
10. Mention the important applications of nanomaterials.