1. Which of the following properties change, if a bulk material is converted to a nanomaterial? All the above
2. Spin forbidden spontaneous emission, which occurs after certain time lag, is known as Phosphorescence
3. Spin allowed spontaneous emission without any time lag is known as Fluorescence
4. Emission of radiation from an excited state of an atom in the presence of radiation field is known as Stimulated emission
5. Emission of radiation from an excited state of an atom in the absence of radiation field is known as Spontaneous emission
6. The collective lattice vibrations are called Phonons
7. The collective magnetic excitation is called magnon
8. The collective electronic excitation is called Photon
9. Local structural information of a solid materials can be obtained from Quadrupole splitting
10. The impurity states in the semiconductor nano-structures strongly dependent on all the above
11. The AC conductivity increases with increasing frequency is case of nano particles
12. Arrhenius expression for resistivity as a function of temperature is: \( \rho = \rho_0 \exp \left( \frac{E}{kT} \right) \)
13. The following are the applications of electro-optic materials: all the above
14. The change in the optical properties by an external applied stress is known as effect: elasto optic
15. The change in the optical properties of a material interacting with the magnetic field is known as effect: magneto optic
16. The indices and optical absorption are given as a function of the wavelength
17. The losses in the fiber optics are indicated in dB/km.
18. Hall-Petch equation is about yield strength and grain size
19. The critical stress intensity factor (KIC) or the fracture toughness is a measure of the stress required to initiate a rapid crack propagation in brittle materials
20. Griffith's theory is applicable to the glasses
21. How many oxygen ions make the lowest side of nano particle: 7
22. Optical density (OD) can be defined by the relation: OD = \( \log_{10} \left( \frac{I_0}{I} \right) \)
23. According to the Langevin's theory, the specific magnetic moment (\( m \)) of a given materials is written as: \( M = N \mu_0 \frac{I}{3k_B T} \)
24. The resistivity of ferrites and metallic magnets will be of the order: \( \rho = 10^7 \text{ ohm} \cdot \text{cm} \)
25. The hysteresis loss is less for soft magnetic materials.
26. The temperature below which certain metals are antiferromagnetic and above which they are paramagnetic is called: neel temperature
27. Equal number of opposite spins with different magnitude are present in: ferrimagnetic materials
28. Equal number of opposite spins with same magnitude are present in: antiferromagnetic materials
29. For which of the following substances is the magnetic susceptibility independent of temperature? diamagnetic only
30. Hard magnetic materials possess: all the above
31. The susceptibility of a diamagnetic material is about: \( 10^{-5} \)
32. Diamagnetic materials possess: induced dipole moment
33. Magnetic susceptibility equals: magnetization per unit magnetic field intensity
34. The precursor material for the production of the nanosized alumina by DC arc plasma method is: Aluminum
35. The attrition milling is severe for ball to powder ratio: 10:1
36. The sintered density is greatly influenced by the Particle size and shape
37. The sample preparation is complex for: TEM
38. Which of the material is used in the manufacture of the spark plugs used in the SI engines: Al2O3
39. The precursor in the sol-gel method for the production of nanosized zirconia powder is: Zirconyl Nitrate
40. Which of the following material has the highest fracture toughness?: PSZ
41. In microwave sintering skin depth is related to the frequency of radiation as: Skin depth is inversely proportional to frequency
42. Attrition milling in the presence of process control agent like ethylene glycol the rate of: Fragmentation is dominant than welding
43. The depth of focus in SEM is: More than TEM
44. The free silicon dioxide formed by the oxidation of SiC during the attrition milling is removed by: Washing the powder with HF
45. The minimum nano-size particles of ± silicon carbide obtained by attrition grinding of initial ± silicon carbide particles with an average size of 0.39 \( \mu \)m is: \( \rightarrow 37 \) nm
46. Which of the following is correct?: Surface area is inversely proportional to the particle size
47. Which of the following is correct?: Theoretical density > sintered density > green density
48. Hot isostatic pressing is a process of: Elimination of pores by the application of heat and pressure
49. The reduction in particle size in the nanocrystalline regime during attrition milling: Progressively difficult
50. The raw materials for the production of SiC by Acheson process consists of: Sand, Coke Saw dust and salt
51. Sinterability of silicon carbide is low due to: Self diffusion coefficient of defects is low
52. Silicon carbide is a structural material used for the ceramic heat engine due to: High specific strength
53. The bonding in silicon carbide is predominantly: Covalent with 10% Ionic character
54. The resonance absorption or emission of the quantum of energy is known as ______ effect: ____________
55. _______ spectra deals with nuclear aspects: Mossbauer
56. _______ spectra deals with the electronic transition between different energy levels: ESR
57. Mossbauer and ESR spectra are useful in the study of ______ properties of materials: magnetic
58. Brillouin zones are demarked by _______ wave vector \(( k )\)
59. In Classical physics a rotating (or) spinning charge distribution gives rise to ______ magnetic moment
60. Harmonic oscillator has direct relevance to explain ______ behaviour of materials: thermal
61. A localized wave whose amplitude is zero everywhere except in a small region is called ______ wave function
62. Who has introduced an equation of motion for matter waves: Schrodinger
63. Quantum mechanics is useful to understand the behaviour of nanoparticles in the ______ level: __________
64. Nanomaterials find wider applications in ______ fields: All the above
65. In quantum confinement effect, the energy levels of ______ changes: ______
66. Nanowires are the examples of: Two-dimensional nanomaterial
67. Quantum dot is an example of: Three-dimensional nanomaterial
68. Nanomaterials are catalysts because of their enhanced: Chemical activity
69. By reducing the size of a nanomaterial, the change in the interatomic spacing is: Decreased
70. For nanomaterials, the surface area to volume ratio is: Very large
71. Who first visualized the concept of nanotechnology?: Richard Feynman
72. 1 nanometer = \( \rightarrow 10^{-9} \) m