

1. ----- magnetic material is not having permanent magnetic moment  
(a) Paramagnet (b) ferro magnet (c) **diamagnet** (d) antiferro
2. In soft magnetic materials the nature of hysteresis loop is -----  
(a) **Very steep** (b) Very broad (c) Negligible (d) Straight line
3. Grant sand is the replacer of ----- material  
(a) **Silica** (b) copper (c) Aluminium (d) silver
4. In pyralspite garnets, aluminum in ----- site  
(a) X (b) **Y** (c) XY (d) YX
5. A tiny movable magnetized cylindrical volume in thin magnetic material is called-----  
(a) Garnet (b) Magnetoplumbites (c) **Magnetic bubble** (d) Ferrites
6. Magneto resistance is the property of a material to change the value of -----  
(a) **Electrical resistance** (b) Magnetism (c) mobility (d) magnetic moment
7. Magnetoplumbites belong to a family of -----  
(a) Conductors (b) **ferrites** (c) Diamagnet (d) Paramagnet
8. Devices that utilize the spin properties of electrons for their functionality is known as -----  
----- device  
(a) Electronic (b) **Spintronic** (c) Molecular (d) Magnetic
9. Giant magnetoresistance composed of ----- ferromagnetic and nonmagnetic metal layers  
(a) **Alternating** (b) parallel (c) perpendicular (d) same
10. Two ferromagnets are separated by a few atomic layers of insulator are known as -----  
(a) Giant magnetoresistance (b) **Tunnel magnetoresistance** (c) Clossal Magnetoresistance  
(d) None of the above
11. In Colossal magnetoresistance , due to ----- very large magnetoresistive effects exhibit  
(a) **Mixed valancy** (b) divalent ions (c) trivalent ions (d) metals
12. Bubble memory is a ----- memory  
(a) **non-volatile** (b) permanent (c) temporary (c) erasable
13. Which of the following materials is the Multi-ferroic material  
(a) **BiFeO<sub>3</sub>** (b) ZnFe<sub>2</sub>O<sub>4</sub> (c) LaMnO<sub>3</sub> (d) BiMnO<sub>3</sub>
14. Tunnel Magneto-resistance (TMR) is based on the conservation of  
(a) **spin of electrons involved in tunneling** (b) charge of electron involved in tunneling (c) drift velocity of electron involved in tunneling (d) Mobility of electrons involved in tunneling
15. The magnetic moment is measured in terms of Bohr Magneton ( $\mu_B$ ) and the value of  $1 \mu_B$   
a)  **$9.27 \times 10^{-24}$  Ampere metre<sup>2</sup>** (b)  $9.27 \times 10^{-20}$  Ampere metre<sup>2</sup> (c)  $9.27 \times 10^{-4}$  Ampere metre<sup>2</sup> (d)  $9.37 \times 10^{-25}$  Ampere metre<sup>2</sup>

16. In a ferromagnetic material, the temperature at which the hysteresis loop merges into state line is called  
(a) Debye temperature (b) Boltzmann temperature (c) **Curie temperature** (d) Fermi temperature

17. Ferromagnetic substances have

(a) High permeability and low susceptibility (b) low permeability and high susceptibility (c) both permeability and susceptibility low (d) **both permeability and susceptibility high**

18. Which of the following material are feebly attracted by external magnetic fields?

(a) ferromagnetic material (b) ferrimagnetic material (c) **paramagnetic material** (d) diamagnetic material

19. The dimensions of magnetic susceptibility are

(a) Wb/m (b) amp/m (c) Wb/m<sup>2</sup> (d) **dimensionless**

20. The general chemical formula of a ferrite molecule is .....

(a)  $M^{4+}Fe_2^{3+}O_4^{2-}$  (b)  $M^{2+}Fe_2^{2+}O_4^{2-}$  (c)  **$M^{2+}Fe_2^{3+}O_4^{2-}$**  (d)  $M^{2+}Fe_2^{3+}O_3^{2-}$

21. The CMR system  $La_{0.67}Ca_{0.33}MnO_x$  displays more than thousand fold change in the resistance with the application of a .....

(a) 5 T DC magnetic field (b) **6 T DC magnetic field** (c) 7 T DC magnetic field (d) 6 T AC magnetic field

22. The boundary wall between domains is known as

(a) Potential wall (b) **Bloch wall** (c) magnetic wall (d) none of these

23. According to Corpuscular theory, light consists of tiny perfectly elastic particles called \_\_\_\_\_.

(a) **Corpuscles** (b) Photons (c) Phonons (d) Quanta

24. The waves associated with a material particle are called \_\_\_\_\_ waves.

(a) **Matter** (b) Sonic (c) Ultrasonic (d) Infrasonic

25. A variable quantity which characterizes de-Broglie waves is known as \_\_\_\_\_.

(a) Photon (b) **Wave Function** (c) Phonon (d) Field

26. \_\_\_\_\_ equation is applicable to both microscopic and macroscopic particles.

(a) Einstein's (b) Newton's (c) **Schrodinger's** (d) Planck's

27.  $p = |\varphi|^2 = \varphi\varphi^*$  is called \_\_\_\_\_.

(a) **Probability Density** (b) Schrodinger's Equation (c) Probability (d) Planck's Equation

28. A wave function satisfying the condition \_\_\_\_\_ is called normalized wave function.

- (a)  $\iiint \varphi \varphi \, d\tau = 1$  (b)  $\iiint \varphi \varphi \, d\tau = 0$  (c)  $\iiint \varphi \varphi \, d\tau = 0$  (d)  $|\varphi|^2 = 0$

29. The energy levels of an electron in 1 D box are \_\_\_\_\_.

- (a) Discrete (b) Continuous (c) Random (d) Unified

30. Energy of the electron in 1 D box is .....

- (a)  $E_n = n^2 m^2 / 8m l^2$  (b)  $E_n = k^2 h^2 / 8m l^2$  (c)  $E_n = n^2 h^2 / 8m l^2$  (d)  $E_n = n^2 h^2 / 8k l^2$

31. The wave function for the motion of a particle in a potential well of width  $l$  is given as  $\psi = A \sin(n\pi x/l)$ , then  $A$  is

- (a)  $1/a$  (b)  $2/l$  (c)  $\sqrt{2/l}$  (d)  $\sqrt{l/2}$

32. \_\_\_\_\_ is the probability of finding the particle inside the box.

- (a) Quantisation (b) Normalisation (c) Hybridisation (d) Interference

33. De Broglie wavelength is given by

- (a)  $\lambda = h/mv$  (b)  $h = \lambda / mv$  (c)  $\lambda = h/mv$  (d)  $\lambda = h/kv$

34. Eigen value of the 1 D simple harmonic oscillator....

- (a)  $E_n = (n+1/2)\hbar\omega$  (b)  $E_n = (3n+1/2)\hbar\omega$  (c)  $E_n = (n+1/4)\hbar\omega$  (d)  $E_n = (5n+1/2)\hbar\omega$

35. Photoelectric effect involves only

- (a) free-electron (b) bound electron (c) free-electron and bound electron (d)  $\beta$ -particles

36. The de Broglie hypothesis is concerned with

- (a) wave nature of radiations (b) wave nature of all materials particles (c) wave nature of electrons only (d) wave nature of  $\alpha$ -particles

37. The characteristics of wave function  $\psi$  are

- (a) Real function, finite and discontinuous (b) Complex, single valued, finite and continuous function (c) Complex, infinite and discontinuous function (d) Complex single valued and infinite

38. The potential energy of electron in hydrogen atom is ....

(a)  $V = -e^2/\pi\epsilon_0 r$  (b)  $V = -e^2/4\pi\epsilon_0 r n$  (c)  $V = -e^2/3\pi\epsilon_0 r$  (d)  $V = -e^2/4\pi\epsilon_0 r$