

**Unit : 1 Electrostatics****Total marks : 50**

- The branch of physics which deals with charges at rest is called as .....  
a) current electricity      b) electromagnetic induction      c) electrostatic induction      d) electrostatics
- If an glass rod is rubbed with silk, it becomes .....  
a) positively charged      b) negatively charged      c) positively and negatively charged      d) uncharged
- Bodies which do not allow the charges to pass through them are called .....  
a) conductors      b) insulators      c) conductors and insulators      d) none of the above
- The force between two point charges  $q_1$  and  $q_2$  is given by the equation .....  
a)  $F = q_1 q_2 / 4\pi\epsilon_0 r^3$       b)  $F = q_1 q_2 / 4\pi\epsilon_0 r^2$       c)  $F = q_1 q_2 / 4\pi\epsilon_0 r$       d)  $F = q_1 q_2 / 4\pi\epsilon_0 r^4$
- If charged bodies of charges  $5q$ ,  $-3q$ ,  $-2q$  and  $5q$  are brought in contact, then. the total charge = .....  
a)  $15q$       b)  $-15q$       c)  $5q$       d)  $-5q$
- The value of the permittivity of free space is .....  $C^2 N^{-1} m^{-2}$   
a)  $8.854 \times 10^{-12}$       b)  $8.854 \times 10^{12}$       c)  $6.623 \times 10^{-34}$       d)  $1.6 \times 10^{-19}$
- For air,  $\epsilon_r =$  .....  
a) 0      b) 1      c) 2      d) 3
- The force exerted by an electric field  $E$  on a charge  $q$  is .....  
a)  $F = E / q$       b)  $F = Eq$       c)  $F = q / E$       d)  $F = 1 / Eq$
- The unit of electric dipole moment is .....  
a)  $C / m$       b)  $C^2 N^{-1} m^{-2}$       c)  $Js^{-1}$       d)  $C m$
- The electric field at any point on the axial line of an electric dipole is given by the equation .....  
a)  $E = p / 4\pi\epsilon_0 r^3$       b)  $E = 2p \cos \theta / 4\pi\epsilon_0 r^3$       c)  $E = 2p \cos \theta / 4\pi\epsilon_0 r^2$       d)  $E = 2p / 4\pi\epsilon_0 r^3$
- The electric field at any point on the equatorial line of an electric dipole is given by .....  
a)  $E = p / 4\pi\epsilon_0 r^3$       b)  $E = 2p \cos \theta / 4\pi\epsilon_0 r^3$       c)  $E = 2p \cos \theta / 4\pi\epsilon_0 r^2$       d)  $E = 2p / 4\pi\epsilon_0 r^3$
- The torque experienced by an electric dipole in an electric field is given by .....  
a)  $\tau = pE \cos \theta$       b)  $\tau = pE \sin \theta$       c)  $\tau = pE \sin \theta \cos \theta$       d)  $\tau = pE \tan \theta$
- The direction of the electric dipole moment is from ..... to .....  
a)  $+q, -q$       b)  $-q, +q$       c)  $-\infty, -q$       d)  $\infty, +q$
- The net force on an electric dipole in an electric field is  $F =$  .....  
a)  $Eq$       b)  $-Eq$       c) zero      d) infinite
- The relation between the electric field and the electric potential is given by .....  
a)  $E = -dV / dr$       b)  $E = dV / dr$       c)  $E = -dr / dV$       d)  $E = dr / dV$
- The total number of electric lines of forces passing through the given area is called electric .....  
a) potential      b) field      c) flux      d) potential energy
- The unit of electric potential is .....  
a)  $A m$       b)  $A$       c) volt      d)  $Cm$
- The unit of electric intensity is .....  
a)  $A$       b)  $V m^{-1}$       c)  $A m$       d)  $Cm$
- The equation of electric potential due to a point charge is .....  
a)  $V = q / 4\pi\epsilon_0 r$       b)  $V = q / 4\pi\epsilon_0 r^2$       c)  $V = q / 4\pi\epsilon_0 r^3$       d)  $V = p \cos \theta / 4\pi\epsilon_0 r^2$
- The equation of electric potential at any point due to an electric dipole is .....  
a)  $V = p \cos \theta / 4\pi\epsilon_0 r^2$       b)  $V = p \cos \theta / 4\pi\epsilon_0 r^3$       c)  $V = p \cos \theta / 4\pi\epsilon_0 r^4$       d)  $V = q / 4\pi\epsilon_0 r$
- The work done to assemble the charges is called electric .....  
a) potential      b) field      c) flux      d) potential energy
- The unit of electric flux is .....  
a)  $C / m$       b)  $N m^2 C^{-1}$       c)  $Js^{-1}$       d)  $C m$ .
- The total electric flux of the electric field  $E$  over any closed surface is equal to  $1 / \epsilon_0$  times the net charge enclosed by the surface. This is called .....  
a) Ohm's law      b) Gauss law      c) Planck's law      d) Wien's law
- The electric field due to an infinite long straight charged wire is given by the equation  $E =$  .....  
a)  $\lambda / 2\pi\epsilon_0 r$       b)  $r / 2\pi\epsilon_0 \lambda$       c)  $\lambda r / 2\pi\epsilon_0$       d)  $2\pi\epsilon_0 r / \lambda$
- The electric field due to an infinite long charged plane sheet is given by the equation  $E =$  .....  
a)  $\sigma / 2\epsilon_0$       b)  $\sigma / \epsilon_0$       c)  $\sigma 2\epsilon_0$       d)  $2\epsilon_0 / \sigma$
- Electric field at any point in between two parallel sheets of equal and opposite charges is  $E =$  .....  
a)  $\sigma / 2\epsilon_0$       b)  $\sigma / \epsilon_0$       c)  $\sigma 2\epsilon_0$       d)  $2\epsilon_0 / \sigma$
- The electric field at any point inside a uniformly charged spherical shell is .....  
a)  $q / 4\pi\epsilon_0 R^2$       b)  $q / 4\pi\epsilon_0 R$       c)  $q / 4\pi\epsilon_0 R^3$       d) zero

28. Electrostatic shielding is based on the fact that the electric field inside a conductor is .....  
 a) maximum                      b) minimum                      c) zero                      d) infinite
29. The phenomenon of obtaining charges without any contact with another charge is called .....  
 a) electrostatic induction      b) electromagnetic induction      c) static induction              d) dynamic induction
30. The ratio of the charge given to the conductor to the potential developed in it is called .....  
 a) reactance                      b) resistance                      c) inductance                      d) capacitance
31. The unit of capacitance is .....  
 a) ohm                      b) henry                      c) tesla                      d) farad
32. A capacitor is a device to store .....  
 a) current                      b) charges                      c) water                      d) oil
33. The number of electric lines of force originating from 1 coulomb charge is .....  
 a)  $1.129 \times 10^{12}$                       b)  $1.129 \times 10^{13}$                       c)  $1.129 \times 10^{11}$                       d)  $1.129 \times 10^{14}$
34. Non polar molecule is .....  
 a)  $O_2$                       b)  $H_2$                       c)  $N_2$                       d) all these
35. Polar molecule is .....  
 a)  $O_2$                       b)  $H_2$                       c)  $N_2$                       d)  $N_2 O$
36. The magnitude of the induced dipole moment  $p$  is directly proportional to .....  
 a)  $E^2$                       b)  $E$                       c)  $1/E$                       d)  $1/E^2$ .
37. The equation for the capacitance of a parallel plate capacitor with a dielectric is .....  
 a)  $\epsilon_0 \epsilon_r A / \epsilon_r (d-t) + t$       b)  $\epsilon_0 A / d$                       c)  $\epsilon_0 A / \epsilon_r (d-t) + t$                       d)  $\epsilon_0 \epsilon_r A / (d-t) + t / \epsilon_r$
38. When three capacitors  $C_1$ ,  $C_2$  and  $C_3$  are connected in parallel, effective capacitance  $C_p =$  .....  
 a)  $C_1 C_2 C_3 / C_1 + C_2 + C_3$       b)  $C_1 + C_2 + C_3$                       c)  $C_1 C_2 + C_3 / C_1 C_2 C_3$                       d)  $C_1 - C_2 - C_3$
39. Greater the radius of a conductor, ..... is the charge density .....  
 a) smaller                      b) larger                      c) zero                      d) infinity
40. Van de Graff generator produces a potential in the order of ..... volt.  
 a)  $10^4$                       b)  $10^8$                       c)  $10^7$                       d)  $10^3$
41. Like charges ..... and unlike charges ..... each other.  
 a) attract, repel                      b) attract, attract                      c) repel, repel                      d) repel, attract
42. The total charge on a body is given by the equation  $q =$  .....  
 a)  $n/e$                       b)  $n^2 e$                       c)  $ne$                       d)  $1/ne$
43. The permittivity of a medium is .....  
 a)  $\epsilon_0 / \epsilon_r$                       b)  $\epsilon_0 \times \epsilon_r$                       c)  $\epsilon_r / \epsilon_0$                       d)  $1 / \epsilon_0 \epsilon_r$
44. The total number of electric lines of forces originating from a point charge  $q$  in free space is  $N =$  .....  
 a)  $q \epsilon_0$                       b)  $q / \epsilon_0$                       c)  $\epsilon_0 / q$                       d)  $1 / q \epsilon_0$
45. The equation for the torque on an electric dipole is .....  
 a)  $\vec{\tau} = \vec{p} \times \vec{E}$                       b)  $\tau = p \times E$                       c) zero                      d) infinite
46. Electric potential energy is  $U =$  .....  
 a)  $F = q_1 q_2 / 4\pi\epsilon_0 r^3$                       b)  $F = q_1 q_2 / 4\pi\epsilon_0 r^2$                       c)  $F = q_1 q_2 / 4\pi\epsilon_0 r$                       d)  $F = q_1 q_2 / 4\pi\epsilon_0 r^4$
47. The capacitances of a capacitor with and without a dielectric material are  $90\mu F$  and  $9\mu F$ . Then,  $\epsilon_r$  is .....  
 a) 90                      b) 9                      c) 10                      d) 0.1
48. In micro wave oven, ..... are used.  
 a) IR rays                      b) UV rays                      c) visible light                      d) microwaves
49. An electric dipole contains charges  $+3 C$  and  $-3 C$  separated by 1 nm. The dipole moment is given by .....  
 a)  $9 \times 10^{-9} Cm$                       b)  $3 \times 10^{-9} Cm$                       c)  $6 \times 10^{-9} Cm$                       d)  $90 \times 10^{-9} Cm$
50. The work done in moving a charge between any two points on an equipotential surface is .....  
 a) maximum                      b) minimum                      c) zero                      d) infinity

\*\*\*\*\* Best wishes \*\*\*\*\*

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**+2 Physics**

**UNIT : 2 CURRENT ELECTRICITY**

**MARKS : 50**

1. A charge of 180 C passes through a lamp in 3 minutes. The current through it is .....
  - a) 2 A
  - b) 6A
  - c) 3 A
  - d) 1 A
2. A material through which the electric charges can flow freely is called .....
  - a) Insulators
  - b) semiconductors
  - c) conductors
  - d) non-conductors
3. The current is proportional to the ..... velocity.
  - a) drift
  - b) average
  - c) critical
  - d) final
4. A toaster operating at 240 V has a resistance 60 ohm. The power is equal to ..... watt.
  - a) 4
  - b) 960
  - c) 0.25
  - d) 14,400
5. When two 4 ohm resistors are in parallel, the effective resistance is equal to ..... ohm.
  - a) 2
  - b) 4
  - c) 8
  - d) 16
6. In the case of insulators, as the temperature increases, the resistivity .....
  - a) increases
  - b) increases and then decreases
  - c) becomes infinity
  - d) decreases
7. If the resistance of the coil at 0°C is 1 ohm and  $\alpha = 0.004/^\circ\text{C}$ , the resistance at 100°C is .....
  - a) 1.4 ohm
  - b) 2.8 ohm
  - c) 4.2 ohm
  - d) 3.4 ohm
8. The current density has the unit .....
  - a) A
  - b)  $\text{As}^{-1}$
  - c)  $\text{Am}$
  - d)  $\text{A m}^{-2}$
9. The drift velocity acquired per unit electric field is called .....
  - a) density
  - b) resistivity
  - c) conductivity
  - d) mobility
10.  $\text{mho m}^{-1}$  is the unit of .....
  - a) density
  - b) resistivity
  - c) conductivity
  - d) mobility
11. The resistivity of insulators is in the order of .....  $\Omega\text{m}$ .
  - a)  $10^{-8}$  to  $10^{14}$
  - b)  $10^8$  to  $10^{14}$
  - c)  $10^8$  to  $10^{-14}$
  - d)  $10^{-2}$  to  $10^4$
12. In superconductors, the conductivity becomes .....
  - a) maximum
  - b) minimum
  - c) zero
  - d) infinity
13. The tolerance of silver, gold, red and brown rings in a carbon resistor are .....
  - a) 10%, 2%, 5% , 1%
  - b) 10%, 5% , 2%, 1%
  - c) 5%, 2%, 10%, 1%
  - d) 2%, 10%, 5%, 1%
14. Four resistances  $2\Omega, 2\Omega, 4\Omega, 4\Omega$  are connected in series. The effective resistance is equal to .....
  - a) 12 ohm
  - b)  $\frac{2}{3}$  ohm
  - c)  $3/2$  ohm
  - d) 8 ohm
15. Kirchoff's first law is a consequence of conservation of .....
  - a) currents
  - b) charges
  - c) voltages
  - d) energy
16. Wheatstone's bridge principle is used in .....
  - a) Planck's law
  - b) Faraday's laws
  - c) Kirchoff's laws
  - d) Joule's law
17. Kirchoff's second law is a consequence of conservation of .....
  - a) currents
  - b) charges
  - c) voltages
  - d) energy
18. The colours of a carbon resistor are red, green and orange. The value of resistance is ..... k $\Omega$ 
  - a) 25
  - b) 45
  - c) 20
  - d) 15
19. The balancing lengths are  $l_1 = 30$  cm and  $l_2 = 70$  cm when the known resistance of  $14\Omega$  is connected in the right gap of a metre bridge. The value of unknown resistance is .....
  - a) 30 ohm
  - b) 28 ohm
  - c) 6 ohm
  - d) 14 ohm
20. A lamp is operated at 240 V and the current is 0.25 A. The resistance value is ..... ohm.
  - a) 480
  - b) 320
  - c) 960
  - d) 160
21. The balancing lengths are  $l_1 = 510$  cm and  $l_2 = 340$  cm in a potentiometer experiment. The ratio of the emfs is .....
  - a)  $2/3$
  - b)  $3/1$
  - c)  $1/3$
  - d)  $3/2$
22. The instrument used for measuring electrical power is called .....
  - a) wattmeter
  - b) voltmeter
  - c) ammeter
  - d) multimeter
23. The unit of electro chemical equivalent is .....
  - a)  $\text{J / kg}$
  - b)  $\text{kg / C}$
  - c)  $\text{C / kg}$
  - d)  $\text{J / s}$
24. In voltaic cell, the electrolyte is .....
  - a) dil HCl
  - b) dil  $\text{HNO}_3$
  - c) dil  $\text{H}_2 \text{SO}_4$
  - d)  $\text{NH}_4\text{Cl}$
25. In Leclanche cell, at the cathode due to oxidation, Zn atom is converted into ..... ions.
  - a)  $\text{Zn}^{++}$
  - b)  $\text{Cl}^-$
  - c)  $\text{Al}^{++}$
  - d)  $\text{Cu}^{++}$

26. In lead acid accumulator, during discharge the emf falls to about ..... volt.  
 a) 1.5                                      b) 2.2                                      c) 2.0                                      d) 1.08
27. The cell which is rechargeable is .....  
 a) secondary cell                                      b) primary cell                                      c) Leclanche cell                                      d) Daniel cell
28. The internal resistance of the secondary cells is .....  
 a) zero                                      b) very high                                      c) infinity                                      d) very low
29. The mass of the substance liberated at an electrode is given by the equation .....  
 a)  $m = z I t$                                       b)  $m = zI / t$                                       c)  $m = It / z$                                       d)  $m = zt / I$
30. In Daniel cell, the emf value is ..... volt.  
 a) 2.2                                      b) 2.0                                      c) 1.08                                      d) 1.5
31. Three resistors each of  $2 \Omega$  are connected in series with a cell of 12V. The potential drop across each resistor is ..... volt.  
 a) 3                                      b) 2                                      c) 4                                      d) 6
32. A  $10 \Omega$  resistor is connected in series with a cell of emf 10V. A voltmeter is connected in parallel to the cell and it reads 9.9 V. The internal resistance of the cell is ..... ohm.  
 a) 0.1                                      b) 1.01                                      c) 10.1                                      d) 101
33. The work done in moving a charge of  $10 \mu C$  between two points having a potential difference 100 V is ..... joule.  
 a)  $10^{-4}$                                       b)  $10^{-5}$                                       c)  $10^{-3}$                                       d)  $10^{-6}$
34. If a current of 10 A flows through a resistor  $10 k \Omega$ , the power is ..... watt.  
 a)  $10^3$                                       b)  $10^6$                                       c)  $10^5$                                       d)  $10^2$
35. The colour code numbers of yellow and grey in a carbon resistor are .....  
 a) 3 and 7                                      b) 4 and 8                                      c) 4 and 7                                      d) 3 and 8
36. The temperature at which a normal conductor is converted into a super conductor is called .....  
 a) neutral                                      b) superconducting transition temperature                                      c) curie                                      d) inversion
37. The resistivity of copper is  $2 \times 10^{-8} \Omega m$ . The conductivity of it is ..... mho  $m^{-1}$   
 a)  $5 \times 10^7$                                       b)  $5 \times 10^8$                                       c)  $5 \times 10^9$                                       d)  $5 \times 10^6$
38. A copper wire of  $10^{-6} m^2$  area of cross-section, carries a current density  $1.6 \times 10^6 Am^{-2}$  and  $n = 8 \times 10^{28}$  electrons /  $m^3$ . The drift velocity is equal to .....  $ms^{-1}$ .  
 a)  $1.25 \times 10^{-4}$                                       b)  $1.25 \times 10^{-6}$                                       c)  $1.25 \times 10^{-5}$                                       d)  $1.25 \times 10^{-3}$
39. Two wires of same material and same length have resistances  $16 \Omega$  and  $25 \Omega$ . The ratio of the radii of the wires is .....  
 a)  $4 / 5$                                       b)  $5 / 4$                                       c)  $3 / 5$                                       d)  $5 / 3$
40. 1 kWh is equal to ..... J.  
 a)  $36 \times 10^5$                                       b)  $36 \times 10^6$                                       c)  $36 \times 10^7$                                       d)  $36 \times 10^4$
41. The external energy necessary to drive the free electrons in a definite direction is called as .....  
 a) electric potential                                      b) electromotive force                                      c) potential energy                                      d) electric field
42. The rate of flow charges is called as .....  
 a) charge                                      b) voltage                                      c) current                                      d) electric field
43. The direction of flow of positive charges in a conductor is called as the .....  
 a) charge                                      b) voltage                                      c) conventional current                                      d) electric field
44. An electron of charge  $e$  in an electric field  $E$  experiences a force .....  
 a)  $F = E e$                                       b)  $F = E / e$                                       c)  $F = e^2 E$                                       d)  $E^2 e$
45. The unit of mobility is .....  
 a)  $m^2 V^{-1} s^{-1}$                                       b)  $m V^{-1} s^{-1}$                                       c)  $m^2 V s^{-1}$                                       d)  $m^2 V^{-1} s$
46. The quantity of charge passing per unit time through unit area is called as .....  
 a) current                                      b) potential difference                                      c) current density                                      d) electric potential
47. The resistivity of semiconductors is in the order of .....  $\Omega m$ .  
 a)  $10^{-2}$  to  $10^4$                                       b)  $10^8$  to  $10^{14}$                                       c)  $10^{-8}$  to  $10^{-14}$                                       d)  $10^{-12}$  to  $10^{22}$
48. In Computers, ..... can be used as memory or storage elements.  
 a) Insulators                                      b) semiconductors                                      c) super conductors                                      d) conductors
49. The temperature coefficient of resistance of alloys is .....  
 a) zero                                      b) very high                                      c) infinity                                      d) low
50. Germanium and silicon are called as .....  
 a) conductors                                      b) semiconductors                                      c) super conductors                                      d) insulators

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Best wishes

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**+2 Physics****Unit : 3 Effects of electric current****Marks: 50**

1. The electric iron works on the principle of ..... effect of current.  
a) thermo electric      b) Joule's heating      c) Peltier      d) magnetic
2. The melting point of tungsten is ..... °C.  
a) 3000      b) 4000      c) 3380      d) 4380
3. Fuse wire has high resistance and ..... melting point.  
a) high      b) low      c) zero      d) infinity
4. The thermo emf is maximum at a temperature called ..... temperature.  
a) neutral      b) inversion      c) critical      d) Kelvin
5. The unit of Peltier coefficient is .....  
a) ampere      b) ohm      c) volt      d) mho
6. Thomson effect is zero for .....  
a) copper      b) iron      c) mercury      d) lead
7. The unit of Thomson coefficient is .....  
a) ampere      b) volt / °C      c) volt      d) ohm
8. Thermopile is a device used to detect .....  
a) light intensity      b) sound intensity      c) thermal radiations      d) current
9. The equation for the magnetic induction at the centre of the current carrying circular ring is  $B = \dots\dots\dots$   
a)  $\mu_0 n I / 2a$       b)  $2a / \mu_0 n I$       c)  $\mu_0 n I / a$       d)  $2\mu_0 n I / a$
10. Tangent galvanometer works on the principle of .....  
a) Ampere rule      b) Maxwell's right hand rule      c) end rule      d) tangent law
11. The reduction factor of T.G. is given by the equation .....  
a)  $\mu_0 n I / 2a$       b)  $2a / \mu_0 n I$       c)  $2a^2 h / \mu_0 n$       d)  $\mu_0 n / 2aB_h$
12. The magnitude of Lorentz force is  $F = \dots\dots\dots$   
a)  $Bqv \cos\theta$       b)  $Bqv \tan\theta$       c)  $Bqv \sec\theta$       d)  $Bqv \sin\theta$
13. The torque on a current carrying coil is maximum when the coil is ..... to the magnetic field.  
a) parallel      b) perpendicular      c) inclined at an angle      d) none of the above
14. The deflection per unit voltage is called ..... sensitivity of a galvanometer.  
a) current      b) voltage      c) resistance      d) conductance
15. An ideal voltmeter is which has ..... resistance.  
a) zero      b) infinite      c) minimum      d) maximum
16. The product of the current and the loop area is called .....  
a) dipole intensity      b) magnetic dipole moment      c) permeability      d) permittivity
17. The value of the gyromagnetic ratio is .....  $C \text{ kg}^{-1}$ .  
a)  $8.8 \times 10^{10}$       b)  $9.27 \times 10^{-24}$       c)  $4.8 \times 10^{10}$       d)  $1.602 \times 10^{-19}$
18. The magnetic field in a moving coil galvanometer is the ..... magnetic field.  
a) perpendicular      b) radial      c) crossed      d) non-uniform
19. The equation for force on a current carrying conductor in a magnetic field is  $F = \dots\dots\dots$   
a)  $Bqv$       b)  $nav_d e$       c)  $Blv$       d)  $BIl$
20. Lawrence devised .....  
a) cyclotron      b) van de graff generator      c) ac generator      d) galvaometer
21. For a given thermocouple, ..... temperature is a constant.  
a) neutral      b) inversion      c) critical      d) Kelvin
22. Peltier effect is the converse of ..... effect.  
a) Thomson      b) Ampere      c) Seebeck      d) Joule's heating
23. In transformers, dynamos ..... effect is undesirable.  
a) Thomson      b) Ampere      c) Seebeck      d) Joule's heating
24. At the temperature of inversion, the thermo emf is .....  
a) minimum      b) maximum      c) zero      d) infinity
25. Thermal energy may be used to produce an emf. This is called ..... effect.  
a) Joule's law of heating      b) photoelectric effect      c) Peltier effect      d) thermoelectric

26. Joule's law of heating is given by the equation  $H = \dots\dots\dots$  .  
 a)  $I^2 t$                                       b)  $V^2 Rt$                                       c)  $VIt$                                       d)  $IR^2 t$
27. The alloy of nickel and chromium is called .....  
 a) brass                                      b) bronze                                      c) silver                                      d) nichrome
28. The relation between the thermo emf and the temperature is  $V = \dots\dots\dots$   
 a)  $\alpha \theta$                                       b)  $\alpha \theta + \frac{1}{2}\beta\theta^2$                                       c)  $\frac{1}{2}\beta\theta^2$                                       b)  $\alpha \theta + \beta\theta^2$
29. The amount of heat absorbed or evolved at one junction in Peltier effect is  $H = \dots\dots\dots$   
 a)  $I^2 t$                                       b)  $\pi It$                                       c)  $VIt$                                       d)  $IR^2 t$
30. Sn, Au, Ag, Zn, Cd, Sb show ..... effect.  
 a) Negative Thomson                                      b) Positive Thomson                                      c) Seebeck                                      d) Joule's heating
31. Bi, Ni, Pt, Co, Fe, Hg show ..... effect.  
 a) Negative Thomson                                      b) Positive Thomson                                      c) Seebeck                                      d) Joule's heating
32. Seebeck effect is a ..... process.  
 a) magnetic                                      b) reversible                                      c) irreversible                                      d) electromagnetic
33. The thermo emf produced in Bi- Ag thermo couple is ..... Bi-Sb thermo couple.  
 a) larger than                                      b) smaller than                                      c) equal                                      d) none of the above
34. Peltier coefficient depends on pair of metals in contact and the ..... of the junction.  
 a) voltage                                      b) resistance                                      c) temperature                                      d) none of the above
35. The unit of the magnetic induction is .....  
 a) ampere                                      b) ohm                                      c) volt                                      d) tesla
36. The magnetic induction due to infinitely long straight conductor carrying current is  $B = \dots\dots\dots$   
 a)  $\mu_0 I / 2a$                                       b)  $2a / \mu_0 nI$                                       c)  $2aB_H / \mu_0 n$                                       d)  $\mu_0 I / 2\pi a$
37. Around a current carrying conductor magnetic field is associated. This was observed by .....  
 a) Ampere                                      b) Oersted                                      c) Biot                                      d) Faraday
38. Tangent galvanometer is most sensitive for a deflection of .....  
 a)  $30^\circ$                                       b)  $45^\circ$                                       c)  $60^\circ$                                       d)  $90^\circ$
39. Tangent law is  $B = \dots\dots\dots$  .  
 a)  $B_H \tan \theta$                                       b)  $B_H \sec \theta$                                       c)  $B_H \sin \theta$                                       d)  $B_H \cot \theta$
40. .... law can be written as  $\int B \cdot dl = \mu_0 \dots\dots\dots$   
 a) Maxwell's right hand                                      b) Ampere's circuital                                      c) Seebeck                                      d) Joule's heating
41. When a charged particle moves in a circular path in a magnetic field, the time period is  $T = \dots\dots\dots$   
 a)  $Bq / 2m$                                       b)  $2m / Bq$                                       c)  $2\pi m / Bq$                                       d)  $Bq / 2\pi m$
42. The torque on a rectangular coil of wire in a magnetic field is .....  
 a)  $nBIA \tan \theta$                                       b)  $nBIA \cos \theta$                                       c)  $nBIA \sin \theta$                                       d)  $nBIA \sec \theta$
43. The deflection per unit current is called ..... sensitivity of a galvanometer.  
 a) current                                      b) voltage                                      c) resistance                                      d) conductance
44. The current sensitivity is given by  $(\theta / I) = \dots\dots\dots$   
 a)  $nCB / I$                                       b)  $nBAC$                                       c)  $BII$                                       d)  $nBA / C$
45. To convert a galvanometer in to an ammeter, a ..... resistance is connected in parallel with the galvanometer.  
 a) low                                      c) infinite                                      c) high                                      d) very high
46. To convert a galvanometer in to a voltmeter, a ..... resistance is connected in series with the galvanometer.  
 a) low                                      b) very small                                      c) high                                      d) zero
47. Bohr magneton value is .....  $Am^2$ .  
 a)  $8.8 \times 10^{10}$                                       b)  $9.27 \times 10^{-24}$                                       c)  $4.8 \times 10^{10}$                                       d)  $1.602 \times 10^{-19}$
48. A current of 0.2 A flows through a circular loop of area  $10 \text{ cm}^2$ . The magnetic dipole moment is .....  $Am^2$   
 a)  $9.27 \times 10^{-24}$                                       b)  $8.8 \times 10^{10}$                                       c)  $2 \times 10^{-4}$                                       d) 2
49. In TG, a current of 1A produces a deflection of  $30^\circ$ . The current that produces a deflection of  $60^\circ$  is ..... A.  
 a) 2                                      b) 3                                      c) 5                                      d) 1
50. The resistance of the tungsten wire of a 100W,220V bulb is ..... ohm.  
 a) 2.2                                      b) 220                                      c) 100                                      d) 484

\*\*\*\*\* Best wishes \*\*\*\*\*

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**Unit : 4      Electro magnetic induction      and      Alternating currents      Marks : 50**

01. Lenz law is in accordance with the law of conservation of .....  
 a) momentum      b) energy      c) voltage      d) current
02. The self inductance of a straight conductor is .....  
 a) infinity      b) zero      c) maximum      d) minimum
03. The unit henry can also be written as .....  
 a) H      b) A      c)  $V \text{ s } A^{-1}$       d)  $m / s$
04. Transformer works on ..... currents only.  
 a) direct      b) alternating      c) both direct and alternating      d) steady
05. The part of the AC generator that passes the current from the coil to the external circuit is  
 a) armature      b) slip rings      c) field magnet      d) brushes
06. The number of magnetic lines of forces crossing unit area in a magnetic field is magnetic .....  
 a) flux      b) induction      c) permeability      d) radiation
07. Electromagnetic induction was discovered by .....  
 a) Lenz      b) Hertz      c) Michael Faraday      d) Oersted
08. Fleming's right hand rule is also called as ..... rule.  
 a) cork screw      b) thumb      c) end      d) generator
09. The unit of self inductance is .....  
 a) H      b) A      c)  $V \text{ s } A^{-1}$       d)  $m / s$
10. The energy stored in an inductor is given by  $E =$  .....  
 a)  $\frac{1}{2} L^2 I_0$       b)  $L I_0^2$       c)  $L / I_0^2$       d)  $\frac{1}{2} L I_0^2$
11. The equation for the mutual induction of two long solenoids is .....  
 a)  $\mu_0 N_1 N_2 A / l$       b)  $l / \mu_0 N_1 N_2 A$       c)  $\mu_0 N_1 N_2 A^2 / l$       d)  $N_1 N_2 A / l$
12. The induced emf by changing the area enclosed by a coil in a magnetic field is  $e =$  .....  
 a)  $E_0 \sin \omega t$       b)  $- Blv$       c)  $- B \dot{l}$       d)  $- NBIA$
13. When the plane of a coil is perpendicular to a magnetic field, the induced emf is .....  
 a) maximum      b) minimum      c) zero      d) infinity
14. AC generator is a device used for converting the mechanical energy into .....  
 a) sound energy      b) heat energy      c) electrical energy      d) light energy
15. If a number armature coils are used in the alternator, it is called as ..... alternator.  
 a) single phase      b) two phase      c) three phase      d) poly phase
16. Electro magnetic brakes use ..... current .  
 a) direct      b) uni-directional      c) eddy      d) steady
17. Transformer works on the ..... principle.  
 a) electro static induction      b) Huygens's      c) electromagnetic induction      d) self induction
18. The ratio of the output power to the input power of a transformer is called .....  
 a) velocity ratio      b) mechanical advantage      c) power loss      d) efficiency
19. Eddy current losses are minimized by using a core made of ..... an alloy of steel.  
 a) mumetal      b) stelloy      c) brass      d) nichrome
20. The frequency of AC used for domestic power in India is .....  
 a) 0 Hz      b) 50 Hz      c) 100 Hz      d) 400 Hz
21. The average value of the AC over one complete cycle is .....  
 a) 0      b) maximum      c) minimum      d) infinity
22. The relation between  $I_{\text{rms}}$  and  $I_0$  is .....  
 a)  $I_{\text{rms}} = I_0 / \sqrt{2}$       b)  $I_{\text{rms}} = I_0 \times \sqrt{2}$       c)  $I_{\text{rms}} = I_0 / 2$       d)  $I_{\text{rms}} = \sqrt{I_0} / 2$
23. In an AC circuit containing R only, the phase difference between current and voltage is .....  
 a) 0      b)  $\pi / 2$       c)  $\pi / 4$       d)  $\pi$
24. The inductive reactance  $X_L$  is given by  $X_L =$  .....  
 a)  $L \omega$       b)  $1 / L \omega$       c)  $L / \omega$       d)  $\omega / L$
25. A capacitor offers infinite resistance to ..... current.  
 a) alternating      b) direct      c) varying      d) sinusoidal

26. In RLC circuit, the instantaneous current is given by  $I = \dots\dots\dots$   
 a)  $I_0 \sin(\omega t \pm \phi)$     b)  $I_0 \tan(\omega t \pm \phi)$     c)  $I_0 \cos(\omega t \pm \phi)$     d)  $I_0 / \sqrt{2}$
27. The equation for Q factor is given by  $Q = \dots\dots\dots$   
 a)  $1/2\pi\sqrt{L/C}$     b)  $R(\sqrt{L/C})$     c)  $1/R(\sqrt{L/C})$     d)  $1/RLC$
28. The average power consumed over a complete cycle is  $P_{av} = \dots\dots\dots$   
 a)  $E_{rms} I_{rms} \tan \phi$     b)  $E_{rms} I_{rms} \sin \phi$     c)  $E_{rms} I_{rms} \sec \phi$     d)  $E_{rms} I_{rms} \cos \phi$
29. Choke coil is used to control the current in an  $\dots\dots\dots$  circuit.  
 a) DC    b) AC    c) AC and DC    d) steady
30. Choke coils are used in  $\dots\dots\dots$  tubes which work on alternating currents.  
 a) filament    b) oil    c) fluorescent    d) glass
31. The reactance of an inductor is  $\dots\dots\dots$  proportional to the frequency.  
 a) first directly, then inversely    b) first inversely, then directly    c) directly    d) inversely
32. Shell type cores are used to minimize  $\dots\dots\dots$  losses.  
 a) eddy current    b) power    c) hysteresis    d) flux
33. The number of magnetic lines of forces crossing a closed area is called magnetic  $\dots\dots\dots$   
 a) flux    b) induction    c) permeability    d) radiation
34. The selectivity or sharpness of a resonant circuit is measured by the  $\dots\dots\dots$  factor.  
 a) safety    b) power    c) quality    d) energy
35. The ratio of the voltage across a coil or capacitor to the applied voltage is called as  $\dots\dots\dots$  factor.  
 a) safety    b) quality    c) power    d) energy
36. For normal frequencies, the Q factor lies between  $\dots\dots\dots$   
 a) 1 and 10    b) 100 and 1000    c) 10 and 100    d) 0.1 and 10
37. For radio frequencies, air chokes are used. These chokes are called as  $\dots\dots\dots$  chokes.  
 a) AF    b) AF or RF    c) RF or HF    d) AF or HF
38. Whenever there is a change in the magnetic flux linked with a closed circuit, an emf is induced in it. This phenomenon is called  $\dots\dots\dots$   
 a) electro static induction    b) action of points    c) electromagnetic induction    d) self induction
39. In Fleming's right hand rule, the middle finger points the direction of the  $\dots\dots\dots$   
 a) motion of the conductor    b) magnetic field    c) induced current    d) force
40. The property of the coil which enables to produce an opposing induced emf in it when the current in the coil changes is called  $\dots\dots\dots$   
 a) electro static induction    b) self induction    c) electromagnetic induction    d) induction
41. If two coils are wound on a soft iron core one over the other, the mutual induction is  $\dots\dots\dots$   
 a) zero    b) infinity    c) minimum    d) very large
42. The induced emf is given by the equation  $e = \dots\dots\dots$   
 a)  $E_0 \sin \omega t$     b)  $E_0 \cos \omega t$     c)  $E_0 \sec \omega t$     d)  $E_0 \tan \omega t$
43. In fans,  $\dots\dots\dots$  motors are used.  
 a) electro static induction    b) self induction    c) electromagnetic induction    d) induction
44. In step up transformers, the transformer ratio k is  $\dots\dots\dots$  than one.  
 a) lesser    b) greater    c) smaller    d) none
45. A power of 11kW is transmitted at 5.5kV through a transmission line of 1 ohm. The power loss =  $\dots\dots\dots$   
 a) 4 W    b) 40 W    c) 0.4 W    d) 400 W
46. In an AC circuit containing C only, the phase difference between the current and the voltage is  $\dots\dots\dots$   
 a) 0    b)  $\pi/2$     c)  $\pi/4$     d)  $\pi$
47. In an LCR circuit, at resonance, the impedance is  $\dots\dots\dots$  and the current is maximum.  
 a) minimum    b) maximum    c) infinity    d) zero
48. The rms value of the AC is  $\dots\dots\dots$  times the peak value of the alternating current.  
 a) 1.414    b) 1.732    c) 0.707    d) 2.000
49. The direction of the eddy current can be noted by  $\dots\dots\dots$   
 a) Faraday's laws    b) Lenz's law    c) cork screw rule    d) end rule
50. In a three phase AC generator, the emf's of the coils differ by  $\dots\dots\dots$   
 a)  $120^\circ$     b)  $180^\circ$     c)  $90^\circ$     d)  $0^\circ$

\$\$\$\$ **Best wishes** \$\$\$\$

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**+2 Physics**

**Unit – 5 Electromagnetic waves and wave optics**

**Marks : 50**

1. Electromagnetic waves are discovered by -----
  - a) Planck
  - b) J.C.Maxwell
  - c) Newton
  - d) Huygens
2. An accelerated charge is a source of -----
  - a) electromagnetic radiation
  - b) heat radiation
  - c) mechanical waves
  - d) longitudinal waves
3. Electromagnetic waves are ----- in nature.
  - a) mechanical waves
  - b) longitudinal waves
  - c) transverse
  - d) none of the above
4. The relation between the velocity of light  $C$ ,  $\mu_0$  and  $\epsilon_0$  is given by the relation  $C =$  -----
  - a)  $1 / \sqrt{\mu_0 \epsilon_0}$
  - b)  $\sqrt{\mu_0 \epsilon_0}$
  - c)  $\sqrt{\mu_0 / \epsilon_0}$
  - d)  $\sqrt{\epsilon_0 / \mu_0}$
5. Hertz produced electromagnetic waves of frequency -----
  - a)  $5 \times 10^9$  Hz
  - b)  $5 \times 10^7$  Hz
  - c)  $5 \times 10^{-7}$  Hz
  - d)  $5 \times 10^{-9}$  Hz
6. Electromagnetic waves cover a wide range of -----
  - a) directions
  - b) waves
  - c) frequencies
  - d) none of the above
7. Atoms and molecules in an electric discharge tube give ----- rays.
  - a) infra-red
  - b) visible light
  - c) UV
  - d) X
8. The wavelength , the frequency and velocity of light are related by -----
  - a)  $c = \gamma \lambda$
  - b)  $c = \gamma / \lambda$
  - c)  $c = \lambda / \gamma$
  - d)  $c = \gamma / \lambda^2$
9. The frequency range of AM band is -----
  - a) 54 MHz to 890 MHz
  - b) 88 MHz to 108 MHz
  - c) 530 kHz to 1710 kHz
  - d) 88 kHz to 108 kHz
10. The frequency range of FM band is from -----
  - a) 54 MHz to 890 MHz
  - b) 88 MHz to 108 MHz
  - c) 530 kHz to 1710 kHz
  - d) 88 kHz to 108 kHz
11. In Physiotherapy, ----- lamps are used.
  - a) infra-red
  - b) ordinary
  - c) UVray
  - d) X ray
12. The wavelengths of the sodium emission lines are -----
  - a)  $5986 \text{ \AA}$  and  $5890 \text{ \AA}$
  - b)  $5896 \text{ \AA}$  and  $5980 \text{ \AA}$
  - c)  $5869 \text{ \AA}$  and  $5890 \text{ \AA}$
  - d)  $5896 \text{ \AA}$  and  $5890 \text{ \AA}$
13. The ----- spectrum is used to identify the gas.
  - a) continuous
  - b) band
  - c) line
  - d) none of the above
14. Incandescent solids, carbon arc lamp etc. give ----- spectrum.
  - a) continuous
  - b) band
  - c) line
  - d) none of the above
15. Using ----- spectra, the molecular structure of the substance can be studied.
  - a) continuous
  - b) band
  - c) line
  - d) none of the above
16. The example of line absorption spectrum is ----- spectrum.
  - a) solar
  - b) band
  - c) line
  - d) none of the above
17. The sun's outer layer is called -----
  - a) photosphere
  - b) ionosphere
  - c) thermosphere
  - d) chromosphere.
18. The type of delayed fluorescence is called -----
  - a) Raman effect
  - b) Tyndal effect
  - c) Rayleigh scattering
  - d) phosphorescence
19. According to corpuscular theory, light energy is the kinetic energy of the -----
  - a) waves
  - b) light source
  - c) photons
  - d) corpuscles
20. Huygens assumed that light waves are ----- in nature.
  - a) longitudinal
  - b) transverse
  - c) mechanical
  - d) stationary
21. The energy of each photon is given by the equation -----
  - a)  $E = mc^2$
  - b)  $E = h \gamma$
  - c)  $E = ma$
  - d)  $E = mv$
22. The scattering of sunlight by the molecules of the earth's atmosphere is called ----- scattering.
  - a) Raman
  - b) Tyndal
  - c) Rayleigh
  - d) Einstein
23. The scattering of light by the colloidal particles is called ----- effect.
  - a) Raman
  - b) Tyndal
  - c) Rayleigh
  - d) Einstein
24. In industry, ----- spectroscopy is applied to study the properties of the materials.
  - a) Raman
  - b) Tyndal
  - c) Rayleigh
  - d) Einstein
25. The locus of the particles having the same state of vibration is called as -----
  - a) wave
  - b) corpuscle
  - c) wavefront
  - d) photon

26. A linear source of light will give rise to ----- wavefront.  
 a) spherical                                    b) plane    c) cylindrical                                    d) elliptical
27. ----- principle helps us to locate the position and the shape of the wavefront.  
 a) Raman    b) Tyndal    c) Rayleigh    d) Huygen
28. In reflection of light, the angle of incidence = the angle of -----  
 a) refraction    b) polarisation    c) reflection    d) diffraction
29. For total internal ----- to take place, light must travel from denser medium to rarer medium.  
 a) refraction    b) polarisation    c) reflection    d) diffraction
30. The equation of bandwidth of interference fringes is  $\beta =$  -----  
 a)  $\lambda D / d$     b)  $\lambda D d$     c)  $\lambda / D d$     d)  $\lambda d / D$
31. An important application of interference in thin films is the formation of ----- rings.  
 a) Raman's    b) Tyndal's    c) Rayleigh's    d) Newton's
32. The radius of the  $n^{\text{th}}$  dark ring equation is -----  
 a)  $r_n^2 = (n R \lambda)^2$     b)  $r_n = n^2 R \lambda$     c)  $r_n = (n R \lambda)^{1/2}$     d)  $r_n = n R^2 \lambda$
33. The amount of bending in diffraction depends on the -----  
 a) size of the obstacle    b) volume of the obstacle    c) size of the obstacle    d) wavelength of the incident wave.
34. In Fresnel diffraction, the incident wavefront is either -----  
 a) spherical or ellipse    b) plane or ellipsoid    c) spherical or cylindrical    d) elliptical
35. Using spectrometer, ----- diffraction can be observed.  
 a) Fraunhofer    b) Raman    c) Tyndal    d) Rayleigh
36. The combined width of a slit and a ruling is called -----  
 a) grating element    b) prism element    c) polaroid element    d) element
37. In a plane diffraction grating,  $\lambda =$  -----  
 a)  $nm / \sin \theta$     b)  $\sin \theta / nm$     c)  $nm / \sin \theta$     d)  $(nm \sin \theta)^{1/2}$
38. The phenomenon of ----- proves that light waves are transverse.  
 a) refraction    b) polarisation    c) reflection    d) diffraction
39. The plane perpendicular to the plane of vibration is called plane of -----  
 a) refraction    b) polarisation    c) reflection    d) diffraction
40. A device that produces a plane ----- light is called polariser.  
 a) polarized    b) reflected    c) refracted    d) diffracted
41. The angle of incidence at which the reflected beam is completely plane polarised is called angle of -----  
 a) refraction    b) diffraction    c) reflection    d) polarisation
42. The equation for Brewster's law is  $\mu =$  -----  
 a)  $\sin i_p$     b)  $\cot i_p$     c)  $\tan i_p$     d)  $\cos i_p$
43. The polarising angle for glass is -----  
 a)  $57.5^\circ$     b)  $56.5^\circ$     c)  $32.5^\circ$     d)  $50.7^\circ$
44. The pile of plates uses the polarisation by ----- phenomenon.  
 a) refraction    b) polarisation    c) reflection    d) diffraction
45. The double refraction phenomenon was discovered by -----  
 a) Bartholinus    b) Malus    c) Nicol    d) Young
46. Crystals like mica, topaz etc. having two optic axes are called -----  
 a) uni-axial crystals    b) multi-axial crystals    c) biaxial crystals    d) none of the above
47. The refractive index for Canada balsam cement is ----- for both the rays.  
 a) 1.486    b) 1.658    c) 1.550    d) 1.333
48. H polaroids use a thin film of -----  
 a) herapathite crystals    b) polyvinyl alcohol    c) Canada balsam    d) Na Cl
49. Polaroids are used as ----- glasses.  
 a) moon    b) star    c) planet    d) sun
50. In an EM wave, the electric and the magnetic field vectors are at ----- to each other and to the direction of propagation.  
 a)  $45^\circ$     b)  $90^\circ$     c)  $180^\circ$     d)  $145^\circ$

@@@@@

**Best of luck**

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