12TH PHYSICS

MCQS

ALL CHAPTERS

F.Sc. Physics (2nd Year) Multiple Choice Questions

CHAPTER # 12: ELECTROSTATICS

1. Coulomb's law is only applicable for
a) Big charges
b) Small charges
c) Point charges
d) Any charges

2. The force exerted by two charged bodies on one another, obeys Coulomb's law provided that
a) The charges are not too small
b) The charges are in vacuum
c) The charges are not too large
d) The linear dimension of charges is much smaller than distance between them

3. The constant K in Coulomb's Law depends upon
a) Nature of medium
b) System of units
c) Intensity of charge
d) Both a & b

4. A unit if elelctric charge is:
a) Volt
b) Henry
c) Coulomb
d) Weber

5. Presence of dielectric always:
a) Increases the electrostatic force
b) Decreases the electrostatic force
c) Does not effect the electrostatic force
d) Doubles the electrostatic force

6. The S.I unit of permitivity is:
a) Nm^2/C^2
b) C^2/Nm^2
c) Nm/C^2
d) Nm^2/C

7. The lines which provide information about the electric force exerted on charged particles are:
a) Magnetic field lines
b) Electric field lines
c) Tangent lines
d) Curved lines

8. The electric field created by positive charge is:
a) Radially outward
b) Zero
c) Circular
d) Radially inward

9. The value of relative permitivity for all the dielectrics is always:
a) Less than unity
b) Greater than unity
c) Equal to unity
d) Zero

10. Photo-copier and inkjet printers are the applications of:
a) Electronics
b) Magnetism
c) Electrostatics
d) Thermodynamics

11. Selenium is a conductor material when exposed to _____
a) Light
b) Dark
c) Mono chromatic light
d) None of these

12. Selenium is an
a) Insulator
b) Conductor
c) Semiconductor
d) Photoconductor

13. In an inkjet printer, the charged ink drops are diverted by the deflection plates
a) Towards the charging electrodes
b) Towards the gutter
c) Towards a blank paper on which the print is to be taken
d) In inkjet printer ink cannot be charged

14. The electric field produced due to negative charge is always:
a) Radially outward
b) Radially inward
c) Circular
d) Zero

15. The force experience by a unit positive charge placed at a point in an electric field is called:
a) Coulomb's force
b) Faraday's force
c) Lorentz's force
d) Electric field intensity

16. Of the following quantities, the one that is vector in character is an
a) Electric Charge
b) Electric Field Intensity
c) Electric Energy
d) Electric Potential Difference

17. Electric field intensity is also known as
a) Electric potential
b) Electric flux
c) Potential gradient
d) None

18. Potential gradient is defined as
a) $\frac{\Delta E}{\Delta V}$
b) $-\frac{\Delta E}{\Delta V}$
c) $\frac{\Delta r}{\Delta V}$
d) $-\frac{\Delta V}{\Delta r}$

19. The SI unit of E are:
a) $\left(newton/_{meter}\right)$
b) $\left(newton/_{coulomb}\right)$
c) $\left(newton/_{ampere}\right)$
d) $(newton \times meter)$

20. The electric intensity is expressed in unit of N/C or
a) Volts
b) Walt
c) Joules
d) V/m

21. The unit Vm^{-1} is equivalent to:
a) NC^{-1}
b) $N\ C$
c) $NC\ m^{-1}$
d) NmC^{-1}

22. Electric flux is defined as:
a) $\phi = \mathbf{A}.\mathbf{B}$
b) $\phi = \mathbf{E} \times \mathbf{A}$
c) $\phi = \mathbf{E}.\mathbf{A}$
d) $\phi = \frac{\mathbf{E}}{\mathbf{A}}$

23. When vector area is held perpendicular to the field lines, then the magnitude of electric flux is:
a) Negative
b) Maximum
c) Minimum
d) Zero

24. When vector area is held parallel to electric field lines, the the magnitude of electric flux is:
a) Maximum
b) Minimum
c) Either maximum or minimum
d) Negative

25. The SI unit of electric flux is:
a) NmC^{-1}
b) Nm^2C^{-1}
c) NmC^{-2}
d) Nm^2C^{-2}

26. The magnitude of the electric field inside oppositely charged plates, having uniform surface charge density σ, is:
a) $\left(\sigma/_{\varepsilon_0}\right)$
b) $\left(\sigma/_{2\varepsilon_0}\right)$
c) $\left(q/_{\varepsilon_0 r}\right)$
d) $\left(\sigma/_{2\varepsilon_0 r}\right)$

27. The electric intensity near an infinite plate of positive charge will be:
a) $\left(q/_{\varepsilon_0}\right)$
b) $\left(\sigma/_{2\varepsilon_0}\right)$
c) $\left(q/_{A}\right)$
d) $\left(\sigma/_{\varepsilon_0}\right)$

28. If a charged body is moved agaist the electric field, it will gain:
a) Potential energy
b) Kinetic energy
c) Mechanical energy
d) None of these

29. One volt is
- a) One joule per coulomb
- b) One dyne per coulomb
- c) One Newton per coulomb
- d) One watt per second

30. Absolute potential difference, due of point charge of 1C at a distance of 1m is given by:
- a) $9 \times 10^6\ volts$
- b) $9 \times 10^7\ volts$
- c) $9 \times 10^8\ volts$
- d) $9 \times 10^9\ volts$

31. A charge of 0.01 C accelerated through a p.d of 1000 V acquires K.E
- a) 10 J
- b) 100 J
- c) 200 J
- d) 400 eV

32. 1 joule =_____
- a) $6.25 \times 10^{18}\ eV$
- b) $6.25 \times 10^{-18}\ eV$
- c) $1.6 \times 10^{-19}\ eV$
- d) $9.1 \times 10^{-31}\ eV$

33. One electron volt is equal to
- a) $6.25 \times 10^{18}\ J$
- b) $6.25 \times 10^{-18}\ J$
- c) $1.6 \times 10^{-19}\ J$
- d) $9.1 \times 10^{-31}\ J$

34. How many electron will have a charge of one coulomb?
- a) 6.2×10^{18}
- b) 6.2×10^{19}
- c) 5.2×10^{18}
- d) 5.2×10^{19}

35. Gravitational force between two objects does not depends on:
- a) Force
- b) Masses
- c) Distance
- d) Medium

36. The charge on the electron was calculated by
- a) Faraday
- b) J.J. Thomson
- c) Millikan
- d) Einstein

37. The equation for the stokes law is
- a) $6\pi\eta r$
- b) $6\pi\eta r v$
- c) $6rv$
- d) $8\pi\eta r v$

38. The charge determined by the Millikan's experiment is
- a) $q = \frac{qvd}{m}$
- b) $q = \frac{qvd}{g}$
- c) $g = \frac{mgd}{v}$
- d) None

39. Capacitors may be considered as a device for
- a) Storing energy
- b) Increasing resistance
- c) Decreasing resistance
- d) None

40. The medium used b/w the plates of capacitor is called
- a) Polarization
- b) Dielectric
- c) Insulators
- d) Medium

41. Capacity of a capacitor depends upon
- a) Size of plate
- b) Distance b/w plates
- c) Nature of dielectric b/w plates
- d) All of above

42. Farad is defined as:
- a) $\frac{C}{V}$
- b) $\frac{A}{V}$
- c) $\frac{C}{J}$
- d) $\frac{J}{C}$

43. The capacitance of a parallel plate capacitor is given by:
- a) $C = \frac{A}{\varepsilon_0\, d}$
- b) $C = \frac{A\varepsilon_0}{d}$
- c) $C = \frac{\varepsilon_0\, d}{A}$
- d) $C = \frac{d}{\varepsilon_0\, A}$

44. The expression of energy stored in a capacitor is given by:
a) $E = CV^2$
b) $E = \frac{1}{2}CV^2$
c) $E = \frac{1}{2}C^2V$
d) $E = \frac{1}{2}(CV)^2$

45. Unit of energy density of electric field is:
a) $\mathrm{J\,C^{-1}}$
b) $\mathrm{J\,V^{-1}}$
c) $\mathrm{J\,m^{-3}}$
d) $\mathrm{J\,F^{-3}}$

46. The term "RC" has same unit as that of:
a) Potential
b) Capacitance
c) Energy
d) Time

47. The ratio of C_{vac} and C_{med} is equal to
a) ε_r
b) $\frac{1}{\varepsilon_r}$
c) ε_0
d) $\frac{1}{\varepsilon_0}$

48. During charging of a capacitor, the ratio of instantaneous charge and maximum charge on plates of capacitors at t = RC is
a) 36.8%
b) 63.2%
c) 20%
d) 30%

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	c	**17**	c	**33**	c
2	d	**18**	d	**34**	a
3	d	**19**	b	**35**	d
4	c	**20**	d	**36**	c
5	b	**21**	a	**37**	b
6	b	**22**	c	**38**	c
7	b	**23**	d	**39**	a
8	a	**24**	a	**40**	b
9	b	**25**	b	**41**	d
10	c	**26**	a	**42**	a
11	a	**27**	b	**43**	b
12	d	**28**	a	**44**	b
13	b	**29**	a	**45**	c
14	b	**30**	d	**46**	d
15	d	**31**	a	**47**	b
16	b	**32**	a	**48**	b

CHAPTER # 13: CURRENT ELECTRICITY

1. One coulomb per second is equal to
a) Joule
b) Volt
● c) Ampere
d) Walt

2. In the metallic conductor the current is due to flow of _____ charge
a) Positive
● b) Negative
c) Proton
d) None

3. Conventional current flow from
● a) Point of higher potential to point of lower potential
b) Point of lower potential to point of higher potential
c) Point of lower potential to point of lower potential
d) None

4. In the thermocouple the heat energy is converted into
a) Mechanical energy
● b) Electric energy
c) Magnetic energy
d) None

5. The heating effect of current utilized in
● a) Iron
b) Tube light
c) Fan
d) Motor

6. Through an electrolyte, electric current is passed due to drift of
a) Free electrons
● b) Positive and negative ions
c) Free electrons and holes
d) Protons

7. Joule law can be expressed as
● a) $H = I^2Rt$
b) $H = IR^2t$
c) $H = \frac{I^2}{Rt}$
d) $H = \frac{I}{Rt}$

8. The heat produced by passage of current through resistor is:
● a) $H = I^2Rt$
b) $H = IR^2t$
c) $H = \frac{I^2}{Rt}$
d) $H = \frac{I}{Rt}$

9. Current can be measured by using:
a) Heating effect
● b) Magnetic effect
c) Chemical effect
d) None of these

10. In liquids and gases, the current is due to the motion of :
a) Negative charges
b) Positive charges
c) Neutral particles
● d) Both negative and positive charges

11. When electricity passes through the liquid, then process is called:
a) Electro late
● b) Electrolysis
c) Electro-conductor
d) None

12. Magnetic effect of current is utilized in
a) Iron
b) Thermocouple
● c) Measurement of current
d) None

13. The VI-graph of Ohm's law is:
a) Hyperbola
b) Ellipse
c) Parabola
● d) Straight

14. Mathematical form of ohm's law is
a) I = VR
● b) I = V/R
c) I = R/V
d) R = IV

15. Ohm's law is valid for only current flowing in
● a) Conductors
b) Transistors
c) Diodes
d) Electric Areas

16. The proportionality constant between current and potential difference is:
a) ρ
b) R
c) C
d) V

17. 1 ohm is defined as:
a) $\frac{V}{C}$
b) $\frac{V}{A}$
c) $\frac{C}{V}$
d) $\frac{V}{A}$

18. In series circuit the net resistance is
a) Algebraic Sum of all resistance
b) Sum of reciprocals of all resistances in circuit
c) Remain constant
d) None

19. The reciprocal of resistivity is called
a) Resistance
b) Conduction
c) Conductivity
d) None

20. The unit of conductivity is
a) Ω. m
b) $(\Omega.m)^{-1}$
c) $\Omega.m^{-1}$
d) None

21. A wire of resistance R is cut into two equal parts, its resistance becomes R/2. What happens to resistivity?
a) Double
b) Same
c) Half
d) One forth

22. When temperature increases, the resistance of conductor:
a) Increases
b) Decreases
c) Remains constant
d) Vanishes

23. Heat sensitive resistors are called
a) Resistors
b) Capacitors
c) Thermisters
d) Inductors

24. Thermistor can be used for the accurate measurement of
a) Voltage
b) Resistance
c) Temperature
d) Heat

25. The maximum power delivered by battery is:
a) $P_{max} = \frac{E^2}{4r}$
b) $P_{max} = 4rE^2$
c) $P_{max} = VIT$
d) $Unlimited$

26. If the length and diameter of conductor is double, the resistance is
a) Remain same
b) Double
c) Half
d) Four times

27. A wire of uniform cross-section A and length L is cut into two equal parts. The resistance of each part becomes:
a) Double
b) Half
c) 4 times
d) ¼ times

28. The fractional change in resistivity per Kelvin
a) Co-efficient in resistance
b) Co-efficient of resistivity
c) Resistance
d) None

29. In the carbon resistor their value can be find by their
a) Wires
b) Terminals
c) Color Bands
d) Spots

30. The third band is written in the form of power of
a) 2
b) 6
c) 8
d) 10

31. The numerical value of black color is:
a) 3
b) 2
c) 1
d) 0

32. The color code for the color Grey is
a) 7
b) 8
c) 9
d) 5

33. The colors of strips on a certain carbon resistor from extreme left are yellow, black and red respectively. Its resistance is:
a) 4 $k\Omega$
b) 400 Ω
c) 40 Ω
d) 40 $k\Omega$

34. If the tolerance color is gold then it value is
a) $\pm 2\%$
b) $\pm 4\%$
c) $\pm 5\%$
d) $\pm 6\%$

35. Tolerance for silver band is:
a) $\pm 5\%$
b) $\pm 10\%$
c) $\pm 15\%$
d) $\pm 20\%$

36. A rheostat can be used as a
a) Variable resistor
b) Potential divider
c) Both a and b
d) None of these

37. The wire used in Rheostat is made from
a) Constantan
b) Nichrome
c) Manganin
d) Tungston

38. The S.I unit of emf is same as:
a) Work
b) Energy
c) Power
d) Potential Difference

39. The terminal potential difference of a battery of internal resistance "r" and emf "ε" is:
a) $V = \varepsilon + Ir$
b) $V = \varepsilon - Ir$
c) $V = \frac{\varepsilon - r}{I}$
d) $V = \frac{I}{\varepsilon - r}$

40. Which electric bulb has the least resistance?
a) 60 watts
b) 100 watts
c) 200 watts
d) 500 watts

41. An electric heater 220V, 440W has a resistance
a) 2 Ω
b) 110 Ω
c) 0.5 Ω
d) 20 Ω

42. Kirchhoff's first rule is:
a) $\sum V = 0$
b) $\sum R = 0$
c) $\sum I = 0$
d) $\sum T = 0$

43. Kirchhoff's first rule is based on conservation of:
a) Energy
b) Voltage
c) Charge
d) Mass

44. The algebraic sum of all the current at junction is zero, is Kirchhoff's
a) 1st law
b) 2nd law
c) 3rd law
d) 4th law

45. The algebraic sum of voltages changes around a closed circuit or loop is zero, is Kirchhoff's
a) 1st law
b) 2nd law
c) 3rd law
d) 4th law

46. An ideal voltmeter would have an infinite
a) Current
b) Voltage
c) Resistance
d) None of these

47. The emf of two cells can be compared by
a) AVO meter
b) Voltmeter
c) Potentiometer
d) Galvanometer

48. An accurate measurement of emf of a cell is made by

a) A voltmeter
b) An ammeter
● c) A potentiometer
d) All of them

49. The ratio of emf of two cells $\varepsilon_1/\varepsilon_2$, is equal to

● a) l_1/l_2
b) $1:2$
c) l_2/l_1
d) $2:1$

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans
1	c	**18**	a	**35**	b
2	b	**19**	c	**36**	c
3	a	**20**	b	**37**	c
4	b	**21**	b	**38**	d
5	a	**22**	a	**39**	b
6	b	**23**	c	**40**	d
7	a	**24**	c	**41**	b
8	a	**25**	a	**42**	c
9	b	**26**	c	**43**	c
10	d	**27**	b	**44**	a
11	b	**28**	b	**45**	b
12	c	**29**	c	**46**	c
13	d	**30**	d	**47**	c
14	b	**31**	d	**48**	c
15	a	**32**	c	**49**	a
16	b	**33**	d		
17	d	**34**	c		

CHAPTER # 14. ELECTROMAGNETISM

1. The units of magnetic field B, in system international is:
a) Weber
● b) Tesla
c) Gauss
d) Newton

2. One tesla (T) is:
a) $1T = 1N\ A\ m^{-1}$
● b) $1T = 1N\ A^{-1}\ m^{-1}$
c) $1T = 1N\ A\ m$
d) $1T = 1N\ m\ A^{-1}$

3. The magnetic flux "Ø" through an area "A" is:
a) $\emptyset = \mathbf{B} \times \mathbf{A}$
● b) $\emptyset = \mathbf{B}.\mathbf{A}$
c) $\emptyset = \mathbf{A} \times \mathbf{B}$
d) $None\ of\ these$

4. One Tesla is also equal to
a) wb.m^2
● b) wb.m^{-2}
c) wb.m
d) None

5. Torque on a current carrying coil is:
● a) $BINA\ \cos\alpha$
b) $BINA\ \sin\alpha$
c) $BIL\ \cos\alpha$
d) $BIL\ \sin\alpha$

6. The magnetic force is simply a:
a) Reflecting force
● b) Deflecting force
c) Restoring force
d) Gravitational force

7. The galvanometer can be made sensitive if the value of the factor $\frac{C}{BNA}$ is:
a) Made large
● b) Made small
c) Remains constant
d) Infinite

8. When a small resistance is connected parallel to the galvanometer, the resulting circuit behaves as:
a) Voltmeter
b) Wheatstone bridge
● c) Ammeter
d) Potentiometer

9. The anode in the CRO is:
a) Control number of electrons
b) Control the brightness of spot formed
● c) Accelerates and focus the beam
d) At negative potential with respect to cathode

10. The galvanometer constant in a moving coil galvanometer is given by:
a) $K = \frac{NB}{CA}$
● b) $K = \frac{C}{NAB}$
c) $K = \frac{NAB}{C}$
d) $K = \frac{CA}{NB}$

11. $\sum_{r=1}^{N} \mathbf{B}.\mathbf{\Delta L} = \mu_0 I$ is the relation for:
a) Milikan's law
b) Gauss's law
● c) Ampere's aw
d) Lenz's law

12. The brightness of spot on CRO screen is controlled by:
a) Anodes
b) Cathodes
● c) Grid
d) Plates

13. To measure the current in a circuit, ammeter is always connected in:
a) Parallel
● b) Series
c) Sometimes parallel sometimes series
d) Neither series nor parallel

14. If the angle b/w $\vec{v}$ and B is zero then magnetic force will be
a) Max
b) Min
● c) Zero
d) None

15. A charged particles is projected at an angle into a uniform magnetic field. Which of the following parameter of the charged particle will be affected by magnetic field:
a) Energy
b) Momentum
c) Speed
d) Velocity

16. Force on a moving charge in a uniform magnetic field will be maximum, when angle between v and B is:
a) 0°
b) 30°
c) 60°
d) 90°

17. The S.I. unit of magnetic flux is
a) Tesla
b) Weber
c) Joule
d) Newton

18. Beam of electrons are also called:
a) Positive rays
b) x-rays
c) cathode rays
d) cosmic rays

19. Tesla is the unit of
a) Electric field
b) Magnetic field
c) Magnetic field intensity
d) Electric field intensity

20. It is possible to set a charge at rest into motion with magnetic field
a) Yes
b) No
c) Some Time
d) None

21. The grid in CRO _____
a) Controls the number of electrons accelerated by anode
b) Controls the brightness of the spot fall on the screen
c) Both a and b
d) Deflects the beam of electrons

22. To convert a Weston-type galvanometer into voltmeter, the series resistance is given by _____
a) $R_h = \frac{V}{I_g}$
b) $R_h = \frac{V}{I_g} - R_g$
c) $R_h = \frac{V}{R_g} - I_g$
d) $None\ of\ these$

23. The shape of magnetic field around a long straight current carrying wire is
a) Electrical
b) Squire
c) Varies with current
d) Circular

24. The electrons of mass "m" and charge "e" is moving in a circle of radius "r" with speed "v" in a uniform magnetic field of strength "B". then
a) $r \propto m$
b) $r \propto B$
c) $r \propto \frac{1}{v}$
d) $r \propto \frac{1}{m}$

25. The toque in the coil can be increased by increasing
a) Number of turns
b) Current and magnetic field
c) Area of coil
d) All of above

26. A current carrying loop, when placed in a uniform magnetic field will experience
a) Electric flux
b) Torque
c) Magnetic flux
d) Force

27. The magnetic flux will be maximum if the angle between magnetic field strength and vector area is:
a) 0^o
b) 60^o
c) 90^o
d) 180^o

28. One weber is equal to
a) $N.A^2/A$
b) $N.m^2/A$
c) N.A/m
d) N.m/A

29. The waveform of sinusoidal voltage, its frequency and phase can be found by
- a) CRO
- b) Diode
- c) Transistor
- d) Radio

30. The force on a charge particle moving parallel to magnetic field is
- a) Maximum
- b) Minimum
- c) Zero
- d) None

31. The unit of permeability of free space is
- a) T.m/A
- b) $T.m^2/A$
- c) $T.m/A^2$
- d) None

32. The value of μ_o is
- a) $4\pi \times 10^{-6}$
- b) $4\pi \times 10^{-7}$
- c) $4\pi \times 10^{-8}$
- d) $4\pi \times 10^{-9}$

33. The magnetic induction inside current carryin solenoid is
- a) $\mu_o nI$
- b) $\mu_o NL$
- c) $\mu_o N$
- d) None

34. F = Fe + Fm is
- a) Electric force
- b) Magnetic force
- c) Lorentz force
- d) None

35. The material used in fluorescent screen is
- a) Electric
- b) Magnetic
- c) Phosphors
- d) None

36. In the galvanometer the current is proportional to
- a) Magnetic field
- b) Electric field
- c) Angle
- d) None

37. When a small resistance is connected in parallel to the galvanometer it is called
- a) Ammeter
- b) Voltmeter
- c) AVO meter
- d) None

38. The relation between current "I" and deflection "θ" in a moving coil galvanometer is:
- a) $I \propto \frac{1}{\theta}$
- b) $I \propto \cos\theta$
- c) $I \propto \sin\theta$
- d) $I \propto \theta$

39. To convert a galvanometer into voltmeter we connect a resistance in
- a) Series
- b) Parallel
- c) Series or parallel
- d) None

40. AVO-meter is used to find
- a) Current
- b) Voltage
- c) Resistance
- d) All of above

41. An ideal voltmeter has
- a) Small resistance
- b) High resistance
- c) Infinite resistance
- d) None

42. A galvanometer can be more sensitive if C/BAN is made
- a) Very large
- b) Very small
- c) Unaltered
- d) None

43. Ammeter and galvanometer
- a) Are always connected in series
- b) Are always connected in parallel
- c) Both in series and parallel
- d) None

44. The sensitivity of galvanometer is directly depends on
a) Magnetic field
b) Area of coil
c) Number of turns
d) All of above

45. The dot product of magnetic field induction and vector area is called
a) Electric flux
b) Magnetic flux
c) Ampere law
d) None

46. When the number of turns in a solenoid is doubled without any change in the length of the solenoid its self induction will be:
a) Four times
b) Doubled
c) Halved
d) None

47. The wave form of sinusoidal voltage, its frequency and phase can be found by
a) CRO
b) Diode
c) Transistor
d) Radio

48. Voltmeter is used to measure:
a) Current
b) Resistance
c) Temperature
d) Potential difference

49. The resistance of a voltmeter should have a very high resistance
a) It does not disturb the circuit
b) It draws some current
c) It same the galvanometer coil
d) None of these

50. A voltmeter is always connected in:
a) Parallel
b) Series
c) Perpendicular
d) Straight line

51. To find the shunt resistance we used equation
a) $R_S = \frac{IgRg}{I - Ig}$
b) $R_S = \frac{IsRg}{I - Ig}$
c) $R_S = \frac{IgRs}{R - Ig}$
d) $R_S = \frac{IsRs}{I - Ig}$

52. Ammeter is used to measure:
a) Resistance
b) Voltage
c) Current
d) Capacitance

53. An avo-meter is also called:
a) An ammeter
b) A voltmeter
c) A multi.meter
d) An ohm-meter

Key Chapter # 14

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	b	19	b & c	37	a
2	b	20	b	38	d
3	b	21	c	39	a
4	b	22	b	40	d
5	a	23	d	41	c
6	b	24	a	42	b
7	b	25	d	43	a
8	c	26	b	44	d
9	c	27	a	45	b
10	b	28	d	46	a
11	c	29	a	47	a
12	c	30	c	48	d
13	b	31	a	49	a
14	c	32	b	50	a
15	b & d	33	a	51	a
16	d	34	c	52	c
17	b	35	c	53	c
18	c	36	c		

CHAPTER # 15. ELECTROMAGNETIC INDUCTION

1. The induced e.m.f. is produce due to
a) Motion of coil
b) Motion of magnet
● c) The rate of change of flux
d) None

2. The direction of induced current is always so as to oppose the change which causes the current is called:
a) Faraday's law
● b) Lenz's law
c) Ohm's law
d) Kirchhoff's 1st rule

3. The energy stored per unit volume inside a solenoid is calculated by:
● a) $\frac{1}{2}\frac{B^2}{\mu_0}(Al)$
b) $\frac{1}{2}\frac{B^2}{\mu_0}$
c) $\frac{1}{2}\frac{\mu_0}{B^2}(Al)$
d) $\frac{1}{2}\frac{\mu_0}{B^2}$

4. The SI units of induced emf is
a) Ohm
b) Tesla
c) Henry
● d) Volt

5. The principle of an alternating current generator is based on:
a) Coulomb's law
b) Ampere's law
● c) Faraday's law
d) Lenz's law

6. If velocity of a conductor moving through a magnetic field B is made zero, then motional emf is:
a) $-vBL$
b) $-\frac{v}{BL}$
c) $-\frac{BL}{v}$
● d) Zero

7. If we make the magnetic field stronger, the value of induced current is:
a) Decreased
● b) Increased
c) Vanished
d) Kept constant

8. The inductance is more in self induction in:
a) Air cored coil
● b) Iron cored coil
c) Tungsten cored coil
d) None of these

9. One henry is equal to:
● a) $1\ ohm \times 1\ second$
b) $1\ ohm \times 1\ meter$
c) $1\ ohm \times 1\ coulomb$
d) $None\ of\ these$

10. A device which converts electrical energy into mechanical energy is called:
a) Transformer
b) AC generator
● c) DC motor
d) DC generator

11. When constant current flows in primary of transformer, then the emf induced across secondary of transformer is:
● a) Zero
b) Constant
c) Alternating
d) Irregular

12. 1 henry
a) $1\ V\ A\ s^{-1}$
● b) $1\ V\ s\ A^{-1}$
c) $1\ V\ m\ A^{-1}$
d) $1\ V\ A\ m^{-1}$

13. A generator converts mechanical energy into
a) Chemical energy
b) Light energy
c) Heat energy
● d) Electrical energy

14. When a loop of wire is moved across a magnetic field, the current is produced in it is called
a) Eddy current
b) Direct current
c) Photo electric current
● d) Induced current

15. Energy stored in an inductor is:
- ● a) $\frac{1}{2}LI^2$
- b) $\frac{1}{2}LI$
- c) $\frac{1}{2}L^2I^2$
- d) $\frac{1}{2}LI$

16. If fingers of right hand show the direction of magnetic field and palm shows the direction of force, then thumb points for:
- a) Torque
- b) Voltage
- ● c) Current
- d) Induced emf

17. Induced electric current can be explained using which law
- a) Gauss's law
- ● b) Faraday's law
- c) Ohm's law
- d) Ampere law

18. Lenz's law is consistent with law of conservation of
- a) Mass
- ● b) Energy
- c) Charge
- d) None

19. An inductor is a circuit element that can store energy in the form of
- ● a) Magnetic field
- b) Electric flux
- c) Electric field
- d) None

20. The negative sign with induced e.m.f. is due to
- a) Faraday's law
- ● b) Lenz's law
- c) Ampere law
- d) None

21. The relation of motional e.m.f. , when a conductor is move in perpendicular magnetic field, is:
- ● a) E=BLV
- b) E=qBl
- c) E=Blq
- d) E=qVB

22. If we increase the resistance of the circuit containing a coil, the induced e.m.f. will be
- a) Increase
- b) Decrease
- ● c) Remain same
- d) None

23. The self-inductance may be defined by
- ● a) $L = \frac{-\in}{\Delta I / \Delta t}$
- b) $L = \frac{-\Delta I / \Delta t}{\in}$
- c) $L = \frac{-\in}{\Delta \varphi / \Delta t}$
- d) $L = \frac{\in}{\Delta \varphi / \Delta t}$

24. Inductance are measured by
- a) Coulombs
- b) Amperes
- c) Volt
- ● d) Henry

25. An over loaded motor draws
- ● a) Max. current
- b) Min. current
- c) Half
- d) None

26. The co-efficient of mutual inductance is equal to
- a) $\varepsilon\left(\frac{\Delta I_P}{\Delta t}\right)$
- ● b) $\varepsilon\left(\frac{\Delta t}{\Delta I_P}\right)$
- c) $\varepsilon \Delta I_P \Delta t$
- d) None

27. Alternating current changes
- ● a) Its magnitude as well as direction
- b) Only direction but not magnitude
- c) Only magnitude but not direction
- d) None

28. Inductance is measured in:
- a) Volt
- b) Ampere
- ● c) Henry
- d) Ohm

29. The instantaneous value of A.C. voltage is
- a) V = Vo sin 2 $\overline{\pi}$ ft
- b) V = Vo sin 2 ft
- c) V = Vo sin 2 $\overline{\pi}$ wt
- d) None

30. The induced e.m.f. in A.C. generator is
- a) VBL sin ϕ
- b) NESN sing ϕ
- c) NAB sin ϕ
- d) NIAB sin ϕ

31. The back motor effect exist in the
- a) Generator
- b) Mater
- c) A.C. Meter
- d) None

32. The coil used in the generators is called
- a) Commutaters
- b) Slip rings
- c) Armature
- d) None

33. The back ward generator is called
- a) Electric motor
- b) A.C. generator
- c) Reverse generator
- d) None

34. The principle of transformer is
- a) Amperes law
- b) Mutual induction
- c) Motional e.m.f.
- d) None

35. A transformer is a device which step up or stop down
- a) Energy
- b) Power
- c) Voltage
- d) All of above

36. An ideal transformer obeys the law of conservation of:
- a) Flux
- b) Momentum
- c) Emf
- d) Energy

37. The coil which is connected to input of a transformer is called:
- a) Primary
- b) Secondary
- c) Middle
- d) None

38. In the actual transformer, the output is always
- a) Equal to input
- b) Less then input
- c) More than input
- d) None

39. In ideal transformer when applied potential difference is double, the current is:
- a) Doubled
- b) Tripled
- c) Halved
- d) Same

40. For a good transformer the hysterics loop are _____ in size.
- a) Small
- b) Large
- c) Zero
- d) None

41. To minimize the heating effect in the transmission lines
- a) High current, low voltage in used
- b) High voltage, low current in used
- c) Same voltage and current in used
- d) None

42. Maximum emf generated in a generator is:
- a) $\varepsilon = \varepsilon_0 \sin\theta$
- b) $\varepsilon = N\omega AB \sin\theta$
- c) $\varepsilon = N\omega AB$
- d) None of these

43. Induced e.m.f is
- a) Directly proportional to change in flux
- b) Directly proportional to rate of change
- c) of flux
- d) Inversely proportional to change of flux
- e) None of these

44. Lenz's law is in accordance with the law of conservation of:
a) Momentum
b) Angular momentum
c) Energy
d) Charge

45. When motor is at its Max. speed the back e.m.f will be
a) Maximum
b) Zero
c) Cannot tell
d) None of these

46. The application of mutual induction is a
a) Television
b) Radio
c) D.C. motor
d) Transformer

47. The ratio of average induced emf to the rate of change of current in the coil is called:
a) Self inductance
b) Mutual inductance
c) Self inductance
d) Mutual inductanc

48. Which of the following is not present in AC generator:
a) Armature
b) Magnet
c) Slip rings
d) Commutator

Key Chapter # 15

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	c	17	b	33	a
2	b	18	b	34	b
3	a	19	a	35	c
4	d	20	b	36	d
5	c	21	a	37	a
6	d	22	c	38	b
7	b	23	a	39	c
8	b	24	d	40	a
9	a	25	a	41	b
10	c	26	b	42	c
11	a	27	a	43	b
12	b	28	c	44	c
13	d	29	a	45	a
14	d	30	none	46	d
15	a	31	a	47	a
16	c	32	c	48	d

CHAPTER # 16. ALTERNATING CURRENT CIRCUITS

1. The mean value of A.C. over a complete cycle in
a) Maximum
b) Minimum
c) Zero
d) None

2. The inductive reactance is:
a) $X_L = \omega C$
b) $X_L = \omega L$
c) $X_L = \frac{1}{\omega C}$
d) $X_L = \frac{1}{\omega L}$

3. At high frequency, the current through a capacitor of AC circuit will be:
a) Large
b) Small
c) Infinite
d) Zero

4. The highest value reached by the voltage or current in one cycle is called
a) Peak to peak value
b) Peak value
c) Instantaneous value
d) Root mean square value

5. If the motor is overloaded, then the magnitude of "back emf":
a) Increases
b) Decreases
c) Constant
d) Becomes zero

6. A capacitor is perfect insulator for:
a) Alternating current
b) Direct current
c) Both a and b
d) None

7. The process combining low frequency signal with high frequency radio wave is called:
a) Modulation
b) Amplification
c) Demodulation
d) Resonance

8. In pure resistive AC circuit, instantaneous value of voltage or current:
a) Current lags behind voltage
b) Current leads voltage by $\frac{\pi}{2}$
c) Both are in-phase
d) Voltage leads current by $\frac{\pi}{2}$

9. Which of the following requires a material medium for their propagation:
a) Heat waves
b) X-rays
c) Sound waves
d) Ultravoilot rays

10. In modulation, low frequency signal is known as:
a) Loaded signal
b) Fluctuated signal
c) Harmonic signal
d) Modulation signal

11. The mutual induction between two coils depends upon:
a) Area of the coils
b) Number of turns
c) Distance between the coils
d) All of these

12. Pure choke consumes:
a) Minimum power
b) Maximum power
c) No power
d) Average power

13. To construct a step down transformer:
a) $N_S < N_P$
b) $N_P < N_S$
c) $N_S = N_P$
d) $N_S . N_P = 1$

14. Power dissipation in pure inductive or in a pure capacitive circuit is:
a) Infinite
b) Zero
c) Minimum
d) Maximum

15. The practical appllication of phenominon of mutual induction is:
a) Electrical motor
b) Transformer
c) Ac generator
d) DC generator

16. There are _____ types of modulations:
a) 1
b) 2
c) 3
d) 4

17. The SI unit of impedance is:
a) Henry
b) Hertz
c) Ampere
d) Ohm

18. Which of the following is true for a step down transformer:
a) $N_P > N_S$
b) $N_P < N_S$
c) $N_P = N_S$
d) $None\ of\ these$

19. If I_0 is the peak value of AC, its average value over the complete cycle is:
a) $\frac{I_0}{\sqrt{2}}$
b) $\sqrt{2}I_0$
c) $\frac{\sqrt{2}}{I_0}$
d) $zero$

20. At resonance, the phase angle for RLC series resonance circuit equals:
a) 0°
b) 90°
c) 180°
d) 270°

21. The unit of impedance is:
a) Ohm
b) $(Ohm)^{-1}$
c) $(Ohm - m)^{-1}$
d) $no\ unit$

22. A device that allows permits flow of DC through the circuit easily, is called:
a) Inductor
b) Capacitor
c) AC generator
d) Transformer

23. The phase difference between each pair of coils of a three phase AC generator is:
a) 0°
b) 90°
c) 120°
d) 180°

24. Main reason for the world wide use of AC is that it can be transmitted to:
a) Short distances at very low cost
b) Long distances at very high cost
c) Short distances at very high cost
d) Long distances at very low cost

25. If $V_{rms} = 10\sqrt{2}\ volts$, then phase voltage V_0 will be:
a) $10\ volts$
b) $20\ volts$
c) $40\ volts$
d) $\frac{10}{\sqrt{2}}\ volts$

26. At resonance RLC series circuit shows the behavior of:
a) Pure resistive circuit
b) Pure capacitive circuit
c) Pure inductive circuit
d) Pure RLC circuit

27. At resonance, the value of current in RLC series circuit is equal to:
a) $\frac{V_0}{R}$
b) $V_0 R$
c) $\frac{I}{2}$
d) $zero$

28. At high frequency, RLC series circuit shows the behavior of:
a) Pure inductive circuit
b) Pure resistive circuit
c) Pure capacitive circuit
d) Pure RLC circuit

29. The r.m.s. value of A.C current in
a) 0.707 I_o
b) 0.707 V_o
c) 0.707 R_o
d) None

30. In pure resistive A.C. circuit the voltage and current are
a) In phase
b) Voltage leads the current
c) Current leads the voltage
d) None

31. The waves which can also pass through the vacuum are
a) Matter wave
b) Mechanical wave
c) Electromagnetic wave
d) Transverse wave

32. The unit used for capacitive reactance is
a) Volt
b) Ampere
c) Joule
d) Ohm

33. Power dissipated in pure inductor is:
a) Large
b) Small
c) Infinite
d) Zero

34. If the frequency of A.C in large the reactance of capacitor is
a) Large
b) Small
c) Zero
d) None

35. In case of capacitor, the voltage lag behind the current by
a) 90^o
b) 60^o
c) 30^o
d) 180^o

36. In the pure inductor the resistance is
a) Zero
b) Maximum
c) Minimum
d) None

37. In pure inductive circuit the voltage
a) Lead the current by 90^o
b) Ledge the current by 90^o
c) Remain same with current
d) None

38. The reactance of inductor is represented by
a) Xc
b) X_L
c) R_L
d) None

39. If the frequency of A.C. is doubled, the reactance of inductor will be
a) Half
b) Same
c) Double
d) Triple

40. The average power dissipated in a pure inductor is
a) Maximum
b) Minimum
c) Zero
d) None

41. By increasing the frequency of A.C. through an inductor the reactance will be
a) Increases
b) Decreases
c) Remain same
d) None

42. In case of phasor diagram the vector rotates
a) Clockwise
b) Anti clockwise
c) Remain stationary
d) None

43. The combine opposition of resistor, capacitor and inductor is called
a) Reactance
b) Resistor
c) Impedance
d) None

44. The S.I unit of impedance is called
a) Joule
b) Weber
c) Ampere
d) Ohm

45. When A.C. flow through RC series circuit the magnitude of voltage is
a) $V = I\sqrt{R^2 + X_L^2}$
b) $V = I\sqrt{R^2 + X_C^2}$
c) $V = IR$
d) None

46. The magnitude of voltage in case of RL – series circuit
a) $V = I\sqrt{R^2 + X_L^2}$
b) $V = I\sqrt{R^2 + X_C^2}$
c) $V = IR$
d) None

47. The average power in case of A.C. series circuit is
a) $P = VI$
b) $P = VI \cos \varphi$
c) $P = VI \sin \varphi$
d) None

48. In equation P = VI cos φ, the factor cos φ is called
a) Cosine factor
b) Power factor
c) Phase
d) None

49. The behavior of resistance is frequency
a) Dependent
b) Independent
c) No, response
d) None of these

50. The impedance Z can be expressed as:
a) $V_{rms} + I_{rms}$
b) $V_{rms} - I_{rms}$
c) V_{rms}/I_{rms}
d) I_{rms}/V_{rms}

51. At resonance frequency the power factor is
a) One
b) Zero
c) Two
d) Three

52. The frequency at which X_L is equal to X_C in called
a) Resonance frequency
b) Threshold frequency
c) Non-frequency
d) None

53. At resonance frequency the impedance of A.C series circuit is
a) Maximum
b) Minimum
c) Can not explain by give data
d) None

54. In parallel RLC circuit , at resonance frequency, there will be maximum
a) Power
b) Voltage
c) Impedance
d) None

55. The electrical oscillators are used in
a) Metal detectors
b) Amplifier
c) Diode
d) None

56. Which of the following permits direct current to flow easily?
a) Resistance
b) Capacitance
c) Inductance
d) None of these

57. A.M stands for
a) Amplitude Modulation
b) Applied Metal
c) Accurate Measurement
d) None

58. F.M stands for
a) Frequency Modulation
b) Frequency Metal
c) Frequency Member
d) None

59. The process of combing the low frequency signal with high frequency radio-wave is called
a) Modulation
b) Amplification
c) Rectification
d) None

60. A capacitor is perfect insulator for:
a) Alternating current
b) Direct current
c) Both a and b
d) None

61. During each cycle A.C voltage reaches its peak value
a) One time
b) Two times
c) Four times
d) None of these

62. In modulation, high frequency radio wave is called:
a) Fluctuated wave
b) Carrier wave
c) Matter wave
d) Energetic wave

63. At high frequency the reactance of the capacitor is
a) Low
b) Large
c) Very large
d) None of these

64. The behavior of resistance is frequency
a) Dependent
b) Independent
c) No response
d) None of these

65. In an inductor the phase difference between the current and voltage is
a) Current lags voltage by 90^o
b) Voltage lags current by 180^o
c) Current leads voltage by 90^o
d) None of these

66. The condition of resonance reached when
a) $X_C > X_L$
b) $X_L < X_C$
c) $X_L = X_C$
d) None of these

67. The phase difference between coils of three phase A.C is
a) 60^o
b) 45^o
c) 90^o
d) 120^o

68. Modulation is the process in which
a) Amplitude is change
b) Frequency is change
c) Both a & b
d) None of these

69. How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50Hz source?
a) 50 times
b) 100 times
c) 200 times
d) None of these

70. The peak value of sinusoidal voltage in an AC circuit is 50V. The rms value of voltage is roughly equal to
a) 70V
b) 40V
c) 35V
d) 45V

71. In RLC series AC circuit, when $X_L = X_C$ then impedance is
a) Minimum
b) Maximum
c) Zero
d) None

Key Chapter # 16

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	c	25	b	49	b
2	b	26	a	50	c
3	a	27	a	51	a
4	b	28	c	52	a
5	b	29	a	53	b
6	b	30	a	54	c
7	a	31	c	55	a
8	c	32	d	56	c
9	c	33	d	57	a
10	d	34	b	58	a
11		35	a	59	a
12	c	36	a	60	b
13	a	37	a	61	b
14	b	38	b	62	b
15	b	39	c	63	a
16	b	40	c	64	b
17	d	41	a	65	a
18	a	42	b	66	c
19	d	43	c	67	d
20	a	44	d	68	c
21	a	45	b	69	b
22	a	46	a	70	c
23	c	47	b	71	a
24	d	48	b		

CHAPTER # 17. PHYSICS OF SOLIDS

1. What is the S.I unit of modules of elasticity of substances?
- a) Nm^{-2}
- b) Jm^{-2}
- c) Nm^{-1}
- d) Being number, it has no unit

2. The bands in atom containing conductive electrons, according to "band theory of solids" is
- a) Conduction band
- b) Valance band
- c) Forbidden band
- d) None of these

3. The substances which have partially filled conduction bands are called:
- a) Insulators
- b) Semi-conductors
- c) Conductors
- d) Super conductors

4. What type of impurity is to be added to the semi-condutor material to provide holes:
- a) Monovalent
- b) Trivalent
- c) Tetravalent
- d) Pentavalent

5. Which of the following is an example of ductile substances:
- a) Lead
- b) Copper
- c) Glass
- d) Lead and copper

6. When a stress changes the shape of a body, it is called:
- a) Volumetric stress
- b) Shear stress
- c) Tensile stress
- d) Compressional strees

7. The ration of applied stress to volumetric strain is called:
- a) Young's modulus
- b) Shear modulus
- c) Bulk modulus
- d) Tensile modulus

8. Substances which break just after the elastic limit is reached are called:
- a) Ductile substances
- b) Hard substances
- c) Soft substances
- d) Brittle substances

9. Cure temperature for iron is:
- a) 0 ℃
- b) 570 ℃
- c) 750 ℃
- d) 1025 ℃

10. The SI unit of stress is same as that of:
- a) Momentum
- b) Pressure
- c) Force
- d) Length

11. Which of the following has least energy gap?
- a) Conductors
- b) Insulators
- c) Semi-conductors
- d) None of these

12. A magnetism produced by electrons within an atom is due to:
- a) Spin motion of electrons
- b) Orbital motion of electrons
- c) Both Spin and orbital motion of electrons
- d) Vibratory motion of electrons

13. If the conductivity of a material is high, then it is:
- a) An insulator
- b) A semi-conductor
- c) A good conductor
- d) A super condutor

14. A substance having empty conduction band is called:
- a) Semi-conductor
- b) Conductor
- c) Insulator
- d) None of these

15. The stress that produces change in length is known as:
- a) Tensile stress
- b) Shear stress
- c) Volumetic stress
- d) Longitudenal stress

16. What are the dimensions of stress?
a) MLT^{-2}
b) $ML^{-2}T^{-1}$
● c) $ML^{-1}T^{-2}$
d) $ML^{o}T^{-1}$

17. Which one of the following physical quantities does not have the dimensions of force per unit?
a) Stress
● b) Strains
c) Young's modulus
d) Pressure

18. Germanium is:
● a) semi-conductor
b) conductor
c) insulator
d) none of these

19. unit of strain is:
a) $\frac{N}{m^2}$
b) $\frac{N}{m}$
c) $N\ m$
● d) $no\ unit$

20. At curie temperature, iron becomes:
a) Ferromagnet
b) Diamagnet
● c) Paramagnet
d) Super-conductor

21. Materials that undergo plastic deformation before breaking are called _____
a) Brittle
● b) Ductile
c) Amorphous
d) Polymers

22. Formation of large molecule by joining small molecules is _____
a) Fusion
● b) Polymerization
c) Crystallization
d) Subtraction

23. Any alteration produced in shapes, length or volume when a body is subjected to some external force is called _____
a) Stiffness
b) Ductility
c) extension
● d) deformation

24. The energy band occupied by the valence electrons is called _____
a) Energy state
● b) Valence band
c) –ve energy state
d) Conduction band

25. the substances having negative temperature coefficient of resistance is called:
a) Conductors
b) Insulators
● c) Semi-conductor
d) None of these

26. The Curie temperature is that at which _____
a) Semi conductor becomes conductors
● b) Ferromagnetic becomes paramagnetic
c) Paramagnetic becomes diamagnetic
d) Metal becomes super conductor

27. Materials in which valence electrons are tightly bound to their atoms at low temperature are called _____
● a) Semi conductors
b) Super conductors
c) Insulators
d) Conductors

28. The band theory of solids explains satisfactorily the nature of
a) Electrical insulators alone
b) Electrical conductors alone
c) Electrical semi conductors alone
● d) All of the above

29. A vacant or partially filled band is called _____
● a) Conduction band
b) Valence band
c) Forbidden band
d) Empty band

30. A completely filled or partially filled band is called _____
a) Conduction band
● b) Valence band
c) Forbidden band
d) Core band

31. Which one has the greatest energy gap _____
a) Semi-conductors
b) Conductors
c) Metals
● d) Non-metals

32. With increase in temperature, the electrical conductivity of intrinsic semi conductors _____
a) Decreases
● b) Increases
c) Remain the same
d) First increases, then decreases

33. Holes can exists in_____
a) Conductors
b) Insulators
● c) Semi conductors
d) All of the above

34. In a semi conductors, the charge carriers are _____
a) Holes only
b) Electrons only
● c) Electrons and holes both
d) All of the above

35. The net charge on N-type material is _____
a) Positive
b) Negative
c) Both a & b
● d) Neutral

36. The most stable material for making permanent magnet is:
a) Iron
● b) Steel
c) Aluminum
d) Copper

37. Pentavalent impurities are called
● a) Donor impurities
b) Acceptor impurities
c) Sometimes donor and some times
d) Acceptors

38. Minority carriers in N-type materials are
a) Electrons
b) Protons
c) Neutrons
● d) Holes

39. The temperature at which conductors lose its resistivity is called
a) Supper temperature
b) Kelvin temperature
● c) Critical temperature
d) None

40. The magnetic domains are the small regions of the order of
● a) Millimeter
b) Micrometer
c) Micron
d) None of these

41. N-type semi-conductor is obtained by doping intrinsic semi-conductors with _____
a) Tetravalent impurity atom
b) Trivalent impurity atom
● c) Pentavalent impurity atom
d) Hexavalent impurity atom

42. The first supper conductor was discovered by
a) Fermi
● b) Kmaerling
c) Weinberg
d) None

43. Examples of brittle substances are
● a) Glass
b) Copper
c) Lead
d) None

44. Example of crystalline solids are also
a) Metals
b) Ionic compounds
c) Ceramics
● d) All of them

45. a semi-conductor will behave as insulator when:
● a) High potential difference is applied
b) When its temperature is 0 k
c) Pentavalent impurity added
d) Trivalent impurity added

46. The field of long bar magnet is like a
● a) Solenoid
b) Toroid
c) Pieces of magnet
d) None

47. The curie temperature of Iron is
a) 600°C
b) 650°C
c) 700°C
● d) 750°C

48. The examples of diamagnetic are
a) Water
b) Copper
c) Antimony
● d) All of them

49. Strain is dimensionless and has
a) Units
● b) No units
c) S.I units
d) None

50. The electrons occupying the outermost shell of an atom and the electrons occupying in the energy band are called
a) Energy band
● b) Valence band
c) Forbidden energy band
d) None of these

51. Conductors are those materials in which the free electrons
● a) Very large
b) Very small
c) Plenty of
d) None of these

52. The magnetism produced by electrons within an atom is due to
a) Spin motion
b) Orbital motion
● c) Spin & orbital motion
d) None of these

53. The combination of solenoid and a specimen of iron inside it make a powerful magnet called
a) Horse shoe magnet
b) Bar magnet
● c) Electromagnet
d) None of these

54. the substance in which the atoms don't form magnetic dipole are called:
a) ferromagnetic
b) paramagnetic
● c) diamagnetic
d) conductors

55. A current which demagnetize the material completely is called
a) Applied current
● b) Coercive current
c) Maximum current
d) None of these

56. The energy need to magnetize and demagnetize the specimen during the each cycle of magnetizing current is
a) Value of current
b) Value of demagnetizing current
c) Value of magnetic flux density
● d) Area of the loop

57. The temperature below which resistivity of some materials becomes zero, is called:
a) Kelvin temperature
● b) Critical temperature
c) Absolute zero temperature
d) Limiting temperature

58. A well known example of an intrinsic semi-conductor is:
● a) Germanium
b) Phosphorous
c) Aluminum
d) Cobalt

59. The critical temperature for mercury is:
a) 7.2 K
● b) 4.2 K
c) 1.18 K
d) 3.7 K

Key Chapter # 17

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	a	21	b	41	c
2	a	22	b	42	b
3	c	23	d	43	a
4	c	24	b	44	d
5	b	25	c	45	a
6	b	26	b	46	a
7	c	27	a	47	d
8	d	28	d	48	d
9	c	29	a	49	b
10	b	30	b	50	b
11	a	31	d	51	a
12	c	32	b	52	c
13	c	33	c	53	c
14	c	34	c	54	c
15	a	35	d	55	b
16	c	36	b	56	d
17	b	37	a	57	b
18	a	38	d	58	a
19	d	39	c	59	b
20	c	40	a	60	c

CHAPTER # 18. ELECTRONICS

1. A semi – conductor can be used as a rectifier because
- a) It has low resistance to the current flow when forward biased
- b) It has high resistance to the current flow when reversed biased
- c) It has low resistance to the current flow when forward biased and high resistance when reversed biased
- d) None of the above

2. The central region of a transistor is called:
- a) Base
- b) Emitter
- c) Collector
- d) Neutral

3. The SI unit of current gain is:
- a) Ampere
- b) Volt
- c) Ohm-meter
- d) It has no units

4. A NAND gate with two inputs A & B has an output 0 if
- a) A is 0
- b) B is 0
- c) Both A and B are 0
- d) Both A and B are 1

5. The gain G of non inverting operational amplifier is
- a) $G = -\frac{R_2}{R_1}$
- b) $G = 1 + \frac{R_2}{R_1}$
- c) $G = \frac{R_2}{R_1}$
- d) $G = 1 - \frac{R_2}{R_1}$

6. When a PN junction is reverse biased, the depletion region is
- a) Widened
- b) Narrowed
- c) Normal
- d) No change

7. A potential barrier of 0.7 V exist across pn junction made from
- a) Silicon
- b) Germanium
- c) Indium
- d) Gallium

8. A diode characteristics curve is a graph plotted between
- a) Current and time
- b) Voltage and time
- c) Voltage and current
- d) Forward voltage and reverse current

9. The output of AND gate will be 1 when
- a) Both inputs are at 0
- b) Either one input is at 1
- c) Both inputs are at 1
- d) None of these

10. For non-inverting amplifiers if $R_1 = \infty\ \Omega$ and $R_2 = 0\ \Omega$, then gain of amplifier is
- a) -1
- b) 0
- c) +1
- d) infinite

11. An expression for current gain of a transistor is given by
- a) $\beta = \frac{I_B}{I_C}$
- b) $\beta = I_B + I_C$
- c) $\beta = I_C - I_B$
- d) $\beta = \frac{I_C}{I_B}$

12. In n-type materials, the minority carriers are
- a) Free electrons
- b) Holes
- c) Protons
- d) Mesons

13. Transistors are made from
- a) Plastics
- b) Metals
- c) Insulators
- d) Doped semi-conductors

14. The number of diodes in a bridge rectifier is
- a) 4
- b) 2
- c) 3
- d) 5

15. The reverse current through PN junction is
- a) Infinite
- b) Zero
- c) Less than forward current
- d) Greater than forward current

16. Photocells are used for
- a) Security system
- b) Counting system
- c) Automatic door system
- d) All of these

17. Transistor has
a) 2 regions
● b) 3 regions
c) 4 regions
d) 1 region

18. A complete amplifier circuit made on a silicon chip and enclosed in a small capsule is called
a) Diode
b) Inductor
c) Resistor
● d) Operational amplifier

19. The open loop gain of an operational amplifier is of the order of
a) 10^8
● b) 10^5
c) 10^2
d) 10^{-3}

20. The automatic working of streets lights is due to
a) Inductor
b) Capacitor
● c) Comparator
d) Rectifier

21. In half ware rectification, the output DC voltage is obtained across the load for
a) The positive half cycle of input AC
b) The negative half cycle of input AC
c) The positive and negative half cycles of input AC
● d) Either positive or negative half cycle of input AC

22. The color of light emitted by LED depends on
a) Its forward biased
b) Its reversed biased
c) The amount of forward current
● d) The type of semi conductor material used

23. A PN junction photodiode is
a) Operated in forward direction
● b) Operated in reversed direction
c) A very fast photo detector
d) Dependent on thermally generated minority carriers

24. The reverse current through semi-conductor diode is due to
a) Holes
b) Electrons
c) Majority carriers
● d) Minority carriers

25. The potential barrier for PN junction made from Si at room temperature is
a) 0.9 V
b) 0.3 V
● c) 0.7 V
d) 0.8 V

26. Process of conversion of DC to AC is called
● a) Rectification
b) Amplification
c) Oscillation
d) Modulation

27. Which one of the following is called fundamental gate
a) NOR gate
● b) NOT gate
c) NAND gate
d) Exclusive OR gate

28. For proper working of a transistor in normal circuits
a) Emitter base junction is reversed biased, collector base junction is forward biased
b) Emitter base junction is forward biased and collector base junction is forward biased
● c) C-B junction is reversed biased, E-B junction is forward biased
d) C-B junction is reversed biased and E-B junction is reversed biased

29. In a properly biased NPN transistor most of the electrons from the emitter
a) Recombine with holes in the base
b) Recombine in the emitter itself
● c) Pass through the base to the collector
d) Are stopped by the junction barrio

30. A diode characteristic curve is a graph between
a) Current and time
b) Voltage and time
● c) Voltage and current
d) Forward voltage and reverse current

31. A NOR Gate is ON only when all its input are
a) ON
● b) OFF
c) Positive
d) High

32. A logic gate is an electronic circuit which
● a) Makes logic decision
b) Work on binary algebra
c) Alternates between 0 and 1
d) None of these

33. The output of a 2-input OR gate is zero only when its
● a) Both input are zero
b) Either input is 1
c) Both input are 1
d) Either input is 0

34. An XOR gate produces an positive logic output only when its two inputs are
a) High
b) Low
● c) Different
d) Same

35. An AND Gate
a) Implement logic addition
● b) Is equivalent to a series switching circuit
c) Is any or all gate
d) Is equivalent to a parallel switching circuit

36. The only function of a NOT gate is to
a) Stop a signal
b) Re-complement a signal
● c) Invert an input signal
d) Acts as a universal gate

37. The forward current through a semiconductor diode circuit is due to
a) Minority carriers
● b) Majority carriers
c) Holes
d) Electrons

38. The device used for conversion of AC into DC is
a) An oscillator
b) A detector
c) An amplifier
● d) A rectifier

39. The thickness of depletion region is of the order of
a) 10^{-7} m
b) 10^{-6} m
c) 10^{-5} m
d) 10^{-4} m

40. The ratio of β gives the
a) Voltage gain
● b) Current gain
c) Input resistance
d) None

41. The resistance between + ive and – ive inputs of op – amplifier is
a) 100 Ω
b) 1000 Ω
● c) 10^6 Ω
d) None of these

42. Photo – voltic cell have
a) Battery input
● b) No external bias
c) No internal bias
d) None

43. Transistor can be used as
a) Oscillators
b) Switches
c) Memory unit
● d) All of them

44. NOT gate has only
● a) One input
b) Two inputs
c) Many inputs
d) None

45. A photo – diode can switch its current ON and OFF in
a) Milli seconds
b) Micro seconds
● c) Nano seconds
d) None

46. Diode is a device which has _____ terminals.
a) One
● b) Two
c) Three
d) Four

47. Transistor is a device which has _____ terminals.
a) One
b) Two
● c) Three
d) Four

48. The Boolean expression X = A + B represents the logic operation of
a) NAND gate
b) NOR gate
● c) OR gate
d) NOT gate

49. The open loop gain of op – amplifier is
a) Zero
b) High
● c) Very high
d) Low

50. The width of depletion region of a diode
a) Increases under forward bias
b) Is independent of applied voltage
● c) Increases under reverse bias
d) None of these

51. A LED emits lights only
● a) Forward biased
b) Reverse Biased
c) Un biased
d) None of these

52. NAND gate is a combination
- a) AND gate and NOT gate
- b) AND gate and OR gate
- c) OR gate and NOT gate
- d) NOT gate and NOT gate

53. The reverse or leakage current of the diode is of the order of
- a) Microampere
- b) Milli-ampere
- c) Both
- d) None of these

54. Temperature, pressure etc are converted into electronic informations by devices called
- a) LEDs
- b) Sensors
- c) Vacuum tubes
- d) None

55. Base of the transistor is very thin of the order of
- a) $10^{-2}m$
- b) $10^{-4}m$
- c) $10^{-6}m$
- d) $10^{-8}m$

56. How many diodes are used for the full wave bridge rectifier circuit is
- a) Two
- b) Three
- c) Four
- d) None of these

57. The electronic circuits which implement the various logic operations are known as
- a) Digital gates
- b) Logic gate
- c) Voltage operated gate
- d) All of them

58. In a half-wave rectifier the diode conducts during
- a) Both halves of the input cycle
- b) A portion of the positive half of the input cycle
- c) A portion of the negative half of the input cycle
- d) One half of the input cycle

59. The output of a two inputs OR gate is 0 only when its
- a) Both inputs are 0
- b) Either input is 1
- c) Both inputs are 1
- d) Either input is zero

60. For typical transistor as an amplifier
- a) $\frac{V_{out}}{V_{in}} = \beta \frac{R_C}{R_{ie}}$
- b) $\frac{V_{out}}{V_{in}} = \beta$
- c) $\frac{V_{out}}{V_{in}} = \beta \frac{R_{ic}}{R_c}$
- d) $\frac{V_{out}}{V_{in}} = \beta \frac{R_{ie}}{R_{ie}}$

61. The resistance between (+) and (-) of ideal Op-Amp is
- a) High
- b) Low
- c) Infinity
- d) Moderate

Key Chapter # 18

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	c	22	d	43	d
2	a	23	b	44	a
3	d	24	d	45	c
4	d	25	c	46	b
5	b	26	a	47	c
6	a	27	b	48	c
7	a	28	c	49	c
8	c	29	c	50	c
9	c	30	c	51	a
10	c	31	b	52	a
11	d	32	a	53	a
12	b	33	a	54	b
13	d	34	c	55	c
14	a	35	b	56	c
15	c	36	c	57	b
16	d	37	b	58	d
17	b	38	d	59	a
18	d	39		60	a
19	b	40	b	61	a
20	c	41	c		
21	d	42	b		

CHAPTER # 19. DAWN OF MODERN PHYSICS

1. The Einstein mass-energy relationship is
a) $E = mc$
b) $E = mc^3$
● c) $E = mc^2$
d) $E = m^2c^2$

2. When an electron combines with a positron, we get
a) One photon
● b) Two photons
c) Three photons
d) Four photons

3. Production of X-rays can be regarded as the reverse phenomenon of
a) Pair production
● b) Photoelectric effect
c) Compton effect
d) Annihilation of matter

4. The radius of atom is the order of
a) $10^{10}\ m$
● b) $10^{-10}\ m$
c) $10^{-14}\ m$
d) $10^{14}\ m$

5. In 1905, the special theory of relativity was proposed by
a) Maxwell
b) De Broglie
c) Bohr
● d) Einstein

6. Neutron was discovered in 1932 by
a) Bohr
● b) Chadwick
c) Dirac
d) Fermi

7. The rest mass of photon is
a) Infinity
● b) Zero
c) hf
d) mc^2

8. A maximum compton shift in the wavelength of scattered photon will be occur at
a) $\theta = 0°$
b) $\theta = 45°$
c) $\theta = 90°$
● d) $\theta = 180°$

9. The Davisson and Germer experiment indicates
a) Interference
b) Polarization
● c) Electron diffraction
d) Refraction

10. A positron is a particle having
a) Mass equal to electron
b) Charge equal to electron
● c) Equal mass but opposite charge to electron
d) Mass equal to proton

11. In compton scattering, the compton shift $\Delta\lambda$ will be equal to compton wavelength if the scattering angle is
a) 0°
b) 45°
c) 60°
● d) 90°

12. Unit of plank's constant is
a) volt
● b) J s
c) J s^{-1}
d) eV

13. Which one is most energetic?
● a) $\gamma - rays$
b) $X - rays$
c) $Ultraviolet\ rays$
d) $Visible\ light$

14. The total amount of energy radiated per unit orifice area of cavity radiator per unit time is directly proportional to
a) T
b) T^2
c) T^3
● d) T^4

15. Plank's constant h has the same units as that of
a) Linear momentum
● b) Angular momentum
c) Torque
d) Power

16. Photoelectric effect was explained by
a) Hertz
● b) Einstein
c) Rutherford
d) Bohr

17. All motions are
a) Absolute
b) Uniform
● c) Relative
d) Variable

18. The rest mass energy of an electron in MeV is equal to
● a) 0.511
b) 0.611
c) 0.902
d) 1.02

19. An observer shoots parallel to a meter stick at very high speed (relativistic) and finds that the length of meter stick is _____
a) Greater than one meter
b) Less than one meter
c) One meter
d) None of these

20. Linear momentum of a photon is
a) Zero
b) hf/c^2
c) hf/c
d) c^2/hf

21. Photon with energy greater than 1.02 MeV can interact with matter as
a) Photoelectric effect
b) Compton effect
c) Pair production
d) Pair annihilation

22. Stopping potential for a metal surface in case of photo electric emission depends on
a) The threshold frequency for the metal surface
b) The intensity of incident light
c) The frequency of incident light and the work function for metal surface
d) None of these

23. As the temperature of black body is raised, the wavelength corresponding to maximum intensity
a) Shifts towards longer wavelength
b) Shifts towards shorter wavelength
c) Remains the same
d) Shifts towards shorter as well as longer wavelength

24. The name of photon for quantum of light was proposed by
a) Ampere
b) Planck's
c) Thomson
d) Einstein

25. A photon is a _____
a) Unit of energy
b) Positively charged particle
c) Packet of electromagnetic radiations
d) Unit of wavelength

26. The light of suitable frequency falling on matel surface ejects electrons, this phenomenon is called
a) X-ray emission
b) Compton effect
c) Photoelectric effect
d) Nuclear fission

27. The minimum energy needed for a photon to create an electron-positron pair is
a) 1.02 KeV
b) 0.51 KeV
c) 0.51 MeV
d) 1.02 MeV

28. Davisson and Germer indicates _____ in their experiment
a) Electron refraction
b) Electron polarization
c) Electron reflection
d) Electron diffraction

29. In Davison – Germer experiment, the diffracted proton from crystal shows _____
a) Particle property
b) Wave property
c) Light property
d) Quantum property

30. In electron microscope, electric and magnetic field are used as _____
a) Electromagnetic gun
b) Source of electromagnetic waves
c) Deflected charged particle
d) Converging source of electrons

31. The uncertainty in momentum and position is due to its _____
a) Property of matter and radiation
b) Two dimensional motions
c) Emotion of certain wave length
d) Very high velocity

32. The energy radiated is directly proportional to fourth power of Kelvin's temperature is _____
a) Karl-wein's laws
b) Raleigh jeans law
c) Stephens law
d) Planck's

33. The anti-particle of electron is
a) Proton
b) Position
c) Meson
d) Neutron

34. The reverse process of pair-production is
a) Annihilation
b) Materialization
c) Fission
d) Fusion

35. The decrease in length with speed was explained by
a) Einstein
b) Lorentz
c) Bohr
d) None

36. All the motion in this universe are
- a) Absolute
- b) Uniform
- c) Variable
- d) Relative

37. Pair production cannot possible in
- a) Air
- b) Water
- c) Glass
- d) Vacuum

38. The minimum energy required for pair production is
- a) 10.2 Mev
- b) 1.02 Mev
- c) 102 Mev
- d) None

39. The relation $\lambda_{Max}T = Contt.$ is
- a) Wein's Law
- b) Plank's Law
- c) Stephen Law
- d) None

40. A quantity $\sqrt{1-\frac{v^2}{c^2}}$ is always
- a) Greater than one
- b) Less than one
- c) Equal to one
- d) None of these

41. Who gave the idea of matter wave?
- a) De-Broglie
- b) Planck
- c) Einstein
- d) Huygen

42. The Stefen-Boltzmann's constant has the value
- a) $5.67 \times 10^{-5} Wm^{-2}K^{-4}$
- b) $5.67 \times 10^{-6} Wm^{-1}K^{-4}$
- c) $5.67 \times 10^{-6} Wm^{-2}K^{-4}$
- d) $5.67 \times 10^{-8} Wm^{-2}K^{-4}$

43. The energy of photon of radio waves is only about
- a) 10^{-6}eV
- b) 10^{-4}eV
- c) 10^{-10}eV
- d) 10^{-12}eV

44. The idea of quantization of energy was proposed by
- a) Einstein
- b) Max Planck
- c) Compton
- d) None of these

45. Application of photoelectric effect is
- a) Photo diode
- b) Photo transistor
- c) Photocell
- d) None of these

46. In Compton effect, the law/laws are conserved
- a) Energy
- b) Momentum
- c) Both
- d) None of these

47. The equations of pair production is
- a) $hf = 2m_oc^2 - KE(e^-) + K.E\ (e^+)$
- b) $hf = 2m_oc^2 + KE(e^-) + K.E\ (e^+)$
- c) $hf = 2m_o^2c^2 + KE(e^-) + K.E\ (e^+)$
- d) $hf = 2m_o^2c + KE(e^-) + K.E\ (e^+)$

48. Which of the following has the same dimension as h/m_oc?
- a) Length
- b) Time
- c) Mass
- d) None

49. Photon 'A' has twice the energy of photon 'B'. What is the ratio of the momentum of 'A' to that of 'B'?
- a) 4 : 1
- b) 2 : 1
- c) 1 : 2
- d) None

50. Electron is an antiparticle of
- a) Proton
- b) Photon
- c) Positron
- d) Deuteron

Key Chapter # 19

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	c	18	a	35	a
2	b	19	b	36	d
3	b	20	c	37	d
4	b	21	c	38	b
5	d	22	a	39	a
6	b	23	b	40	b
7	b	24	d	41	a
8	d	25	c	42	d
9	c	26	c	43	c
10	c	27	d	44	b
11	d	28	d	45	c
12	b	29	b	46	c
13	a	30	d	47	b
14	d	31	a	48	a
15	b	32	c	49	b
16	b	33	b	50	c
17	c	34	a		

CHAPTER # 20: ATOMIC SPECTRA

1. Which is an example of continuous spectra?
- a) Black body radiation
- b) Molecular spectra
- c) Atomic spectra
- d) None of these

2. Line spectra is an example of
- a) Atomic
- b) Molecular
- c) Black body radiation
- d) None of these

3. The unit of Rydberg's constant R_H is:
- a) m^{-2}
- b) m^{-1}
- c) m^{1}
- d) m^{2}

4. In a meta-stable state an can reside for about:
- a) $10^{-8}s$
- b) $10^{-10}s$
- c) $10^{-9}s$
- d) $10^{-3}s$

5. Which of the following series of H-spectrum lies in ultraviolet region:
- a) Lyman series
- b) Balmer series
- c) Paschen series
- d) Bracket series

6. The reverse process of photoelectric effect is:
- a) Compton effect
- b) X-rays production
- c) Pair production
- d) Pair annihilation

7. Helium-Neon laser discharge tube contains Neon equal to:
- a) 25%
- b) 40%
- c) 15%
- d) 82%

8. The value of Rydberg constant is:
- a) $1.0974 \times 10^{7} m^{-1}$
- b) $1.0794 \times 10^{7} m^{-1}$
- c) $1.0974 \times 10^{9} m^{-1}$
- d) $1.974 \times 10^{7} m^{-1}$

9. The relation between Rhdberg constant R_H and ground state energy E_0 is given by:
- a) $R_H = \frac{E_0}{hc}$
- b) $R_H = \frac{hc}{E_0}$
- c) $E_0 = \frac{R_H}{hc}$
- d) $R_H = E_0 hc$

10. The radius of 3rd Bohr orbit in H-atom is greater than the radius of 1st orbit by the factor
- a) 2
- b) 3
- c) 4
- d) 9

11. The orbital angular momentum in the allowed stationary orbits of H-atom is given by:
- a) $\frac{2\pi}{nh}$
- b) $\frac{nh}{2\pi}$
- c) $\frac{2h}{n\pi}$
- d) $\frac{h}{\pi}$

12. If one or more electrons are completely removed from an atom then the atom is said to be:
- a) Excited
- b) Polarized
- c) Stablized
- d) Ionized

13. The quantized radius of first bohr orbit of H-atom is:
- a) 0.053 nm
- b) 0.0053 nm
- c) 0.00053 nm
- d) 53 nm

14. When an electron absorbs energy, it jumps to:
- a) Lower energy state
- b) Higher energy state
- c) Ground energy state
- d) Remains in the same state

15. LASER light has the property of:
- a) Coherent waves
- b) Non-coherent waves
- c) Sound waves
- d) Water waves

16. Excited atoms return to their ground state in _____
a) 10^{-10} s
b) 10^{-8} s
c) 10^{-6} s
d) 10^{-9} s

17. X-rays are _____
a) Unknown nature
b) High energy electrons
c) High energy photon
d) Radioisotopes

18. Total number of series in hydrogen spectrum is _____
a) Three
b) Four
c) Five
d) Six

19. The radiations emitted from hydrogen filled discharge tube show _____
a) Bound spectrum
b) Line spectrum
c) Continuous spectrum
d) Absorption spectrum

20. If the ionization energy of H-atom is 13.6 eV, its ionization potential will be:
a) 13.6 V
b) 136.0 V
c) 3.4 V
d) None of these

21. Radiation with wavelength longer than red light_____
a) Ultraviolet rays
b) X-rays
c) Infrared radiation
d) Visible radiations

22. Bracket series is obtained when all transition of electron terminate on _____
a) 4th orbit
b) 5th orbit
c) 3rd orbit
d) 2nd orbit

23. X - rays are similar in nature to _____
a) Cathode rays
b) Positive rays
c) γ - rays
d) α – rays

24. The characteristic X-rays spectrum is due to
a) The illumination of the target metal by ultraviolet radiation
b) The bombardment of the target by proton
c) The bombardment of target by electron
d) The absorption of Y-radiation by the target metal

25. Wave like characteristic of electron is demonstrated by _____
a) Line spectrum of atoms
b) Production of X-rays
c) Diffraction by crystalline solids
d) Photo electric effect

26. In laser production, the state in which more atoms are in the upper state then in the lower one is called _____
a) Metal stable state
b) Normal state
c) Inverted population
d) All the above

27. Reflecting mirrors in laser is used to _____
a) Further stimulation
b) Lasing more
c) For production more energetic laser
d) All the above

28. The velocity of laser light is _____
a) Less than ordinary light
b) More than ordinary light
c) Equal to ordinary light
d) Different for different colors or frequency

29. X – rays is also known as
a) Photon
b) γ – rays
c) Breaking radiation
d) none

30. Which one of the following is more coherent
a) X – rays
b) Normal light
c) Laser
d) γ – rays

31. Sunlight spectrum is
a) Discrete
b) Line spectrum
c) Continuous spectrum
d) None

32. Optical pumping exist in
a) X – rays
b) Laser
c) Spectrum
d) None

33. The total energy of electron in an orbit around the nucleus is
a) + ive
b) ive
c) Zero
d) None

34. According to Bohr's theory the outer orbit electron has _____ energy than inner orbits.
a) Greater
b) Smaller
c) Equal
d) None of these

35. X – rays was discovered by
a) Bacquerel
b) Mari – curie
c) Roentgen
d) Lane

36. The value of Plank's constant is
a) 6.63×10^{-34} J.sec
b) 6.63×10^{-34} J/sec
c) 6.63×10^{-34} sec/J
d) None

37. Laser is a device which can produce
Intense beam of light
Coherent light
Monochoromatic light
All

38. When magnetic field is applied in the path X – rays , they will be moving in
a) Straight line
b) Circular path
c) Parabolic path
d) None

39. The quantized energy of first Bohr orbit of hydrogen atom is
a) 13.04 eV
b) 13.6 eV
c) 13.6 eV
d) 13.5 eV

40. In LASER principle, a photon produce another photon by the process of
a) Excitation
b) De-excite
c) Ionization
d) None of these

41. Characteristic X – rays are the X – rays which have
a) High energy photons
b) Specific wavelengths
c) Specific frequencies
d) All of these

42. In Laser a Meta-stable state is
a) An excite state
b) In which an electron is usually stable
c) In which an electron reside 10^{-3} sec
d) None of these

43. The Meta-stable state of Helium and Neon is
a) Different
b) Identical
c) Nearly identical
d) None of these

44. Emission of electrons by metal on heating is called
a) Secondary emission
b) Field effect
c) Photoelectric emission
d) Thermionic emission

45. The numerical value of ground state energy for H-atom in electron volt is:
a) -10
b) 13.6
c) 10
d) -13.6

Key Chapter # 20

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	a	16	b	31	c
2	a	17	c	32	b
3	b	18	c	33	b
4	d	19	b	34	a
5	a	20	a	35	c
6	b	21	c	36	a
7	c	22	a	37	d
8	a	23	c	38	a
9	a	24	c	39	b & c
10	d	25	c	40	
11	b	26	c	41	d
12	d	27	d	42	c
13	a	28	c	43	c
14	b	29	c	44	d
15	a	30	c	45	d

CHAPTER 21: NUCLEAR PHYSICS

1. The energy released by fusion of two deuterons into a He nucleus is about
- a) 24 MeV
- b) 200 MeV
- c) 1.02 MeV
- d) 7.7 MeV

2. Dr. Abdus Salam unified electromagnetic force and _____
- a) Weak nuclear force
- b) Strong nuclear force
- c) Magnetic force
- d) Gravitational force

3. Which of the following have no charge
- a) $\alpha - rays$
- b) $\beta - rays$
- c) $\gamma - rays$
- d) $cathode\ rays$

4. In Wilson cloud chamber, we use:
- a) Alcohol vapours
- b) Neon gas
- c) Bromine gas
- d) Water vapours

5. A high potential difference of _____ is used in GM counter
- a) 400 volts
- b) 1000 volts
- c) 5000 volts
- d) 4000 volts

6. One Curie is equal to:
- a) $3.70 \times 10^{-10}\ Bq$
- b) $3.70 \times 10^{10}\ Bq$
- c) $1\ Bq$
- d) $10^3\ Bq$

7. The most useful tracer isotop for the treatment of thyroid gland is:
- a) Cobalt-60
- b) Carbon-14
- c) Iodine-131
- d) Strontium-90

8. The chemical properties of any element depend on its:
- a) Number of isotopes
- b) Number of isobars
- c) Atomic number
- d) Mass number

9. The number of protons in any atom are always equal to the number of:
- a) Electrons
- b) Neutrons
- c) Positrons
- d) Mesons

10. Types of quarks are:
- a) 4
- b) 6
- c) 8
- d) 10

11. β −particles in Wilson cloud chamber have:
- a) Zigzag or erratic path
- b) Curved path
- c) Circular path
- d) Elliptical path

12. Nuclear fission chain reaction is controlled by using:
- a) Steel rods
- b) Graphite rods
- c) Cadimum rods
- d) Platinum rods

13. Extremely penetrating particles are
- a) Neutrons
- b) α −particles
- c) β −particles
- d) γ −particles

14. The nuclear reaction taking place in sun is:
- a) Fission
- b) Fusion
- c) Chain
- d) Alpha decay

15. An α −particle contains
- a) 1 proton and 1 neutron
- b) 2 protons and 2 neutrons
- c) 3 protons and 3 neutrons
- d) 4 protons and 4 neutrons

16. Which of the following belong to hadrons group:
- a) Protons
- b) Electrons
- c) Muons
- d) Neutrinos

17. Number of isotopes of Helium is:
- a) 2
- b) 3
- c) 4
- d) 5

18. One joule of energy absorbed in a body per kilogram is equal to:
a) 1 rad
b) One rem
● c) One gray
d) One sievert

19. In nucleus of uranium U_{92}^{235}, the number of neutrons will be _____
a) 92
b) 235
● c) 143
d) Different for different isotopes

20. One a.m.u is equal to _____
● a) 1.66×10^{-27} kg
b) 1.66×10^{-25} kg
c) 1.66×10^{-20} kg
d) All of above

21. According to which one of following law, the density of nucleus is uniform ?
● a) J.J. Thomson
b) Rutherford's Model
c) Bohr's Model
d) All of above laws

22. For chain reaction to buildup, the size of the radio active target should be _____
a) 90
● b) Greater than the critical size
c) Less than the critical size
d) Equal to critical size

23. After two half lives, the number of decayed nuclei of an element are:
a) N
b) $\frac{N}{2}$
c) $\frac{N}{4}$
● d) $\frac{3N}{4}$

24. The examples of antimatter are:
a) Antiproton
b) Antineutron
c) Positron
● d) All of above

25. Neutron and proton are commonly known as _____
a) Nucleons
b) Meson
c) Boson
d) Quartz

26. Half life of Radium is 1590 years. In how many years shall the earth loss all his radium due to radioactive decay?
a) 1590×10^{6} years
b) 1590×10^{12} years
c) 1590×10^{25} years
● d) Never

27. Which one of the following radiation possesses maximum penetrating power?
a) α – rays
b) β – rays
● c) γ – rays
d) All have equal penetrating power

28. Energy liberated when one atom of U-235 undergoes fission reaction is _____
● a) 200 Mev
b) 40 Mev
c) 30 Mev
d) 20 Mev

29. Nuclear force exist between
a) Proton – proton
b) Proton – Neutron
c) Neutron – Neutron
● d) All of the above

30. Tick the correct statement
● a) Moderator slow down the neutron
b) Moderator bring the neutrons to rest
c) Moderator absorb the neutron
d) Moderator reflect the neutron

31. Radioactive decay obeys which one of the following data?
● a) $N = N_o e^{-\lambda t}$
b) $N = N_o e^{xt}$
c) $N = N_o e^{-xt/2}$
d) $No = N(Ie^{xt})$

32. Which one of the following possesses maximum velocity?
a) α – rays
b) β – rays
● c) γ – rays
d) All of the above have same speed

33. Charge on an electron was determine by _____
a) Ampere
b) Maxwell
● c) Milliken
d) Thomson

34. Charge on neutron is _____
a) $+1.6 \times 10^{-19}$c
b) -1.6×10^{-19}c
● c) Zero
d) No definite charge

35. A particle having the mass of an electron and the charge of a proton is called
a) Antiproton
b) Positron
c) Gamma rays
d) Photon

36. Mass of neutron is _____
a) 1.67×10^{-13} Kg
b) 1.67×10^{-27} Kg
c) 9.1×10^{-31} Kg
d) 1.67×10^{-19} Kg

37. Nuclei having the same mass number but different atomic number are _____
a) Isotopes
b) Isobars
c) Isotones
d) Isomers

38. A mass spectrograph sorts out _____
a) Molecules
b) Ions
c) Elements
d) Isotopes

39. Sum of the masses of constituent nucleons as compared to the mass of the resultant nucleus is _____
a) Smaller
b) Greater
c) Same
d) Some times smaller some times greater

40. An α - particle is emitted from ${}_{88}Ra^{226}$, what is the mass and atomic number of the daughter nucleus?

	Mass Number	Atomic Number
a)	224	84
b)	220	80
c)	222	86
d)	226	87

41. The unit of Radioactivity "Curie" is equal to _____
a) 3.74×10^{9} disintegration per sec
b) 3.70×10^{10} disintegration per sec
c) 3.55×10^{10} disintegration per sec
d) 3.60×10^{10} disintegration per sec

42. In liquid metal fast breeder reactor, the type of uranium used is _____
a) ${}_{92}U^{235}$
b) ${}_{92}U^{238}$
c) ${}_{92}U^{234}$
d) ${}_{92}U^{239}$

43. Radioactive materials can be identified by measuring their_____
a) Hardness
b) Density
c) Mass
d) Half life

44. If one or more of the neutrons emitted during fission can be used to build up further fission then the reaction is self sustained and is known as _____
a) Fission reaction
b) Fusion reaction
c) Chain reaction
d) Chemical reaction

45. Pair production takes place in the vicinity of heavy nucleus so that _____
a) Net energy is conserved
b) Net charge is conserved
c) Net momentum is conserved
d) All of the above

46. During an encounter with an atom α - particle knocks out _____
a) Protons
b) Electrons
c) Neutrons
d) Nothing

47. Which one of the following radiations are suitable for the treatment of an infection in the interior body?
a) α – rays
b) β – rays
c) γ – rays
d) X – rays

48. Various types of cancer are treated by _____
a) Cobalt 60
b) Strontium – 90
c) Carbon 14
d) Nickel – 63

49. Sterilizations of surgical instrument, medical supplies and bandages can be done by exposing them to a beam of _____
a) α - rays
b) β - rays
c) γ- rays
d) 'b' & 'c' have equal antiseptic properties

50. Charge on α - particle is _____
a) +1
b) +2
c) -2
d) -1

51. B-particle ionizes an atom _____
a) Through direct collision
b) Through electrostatic attraction
c) Through electrostatic repulsion
d) All of above

52. T.V. sets and microwave oven emit _____
a) X - rays
b) α - rays
c) β – rays
d) γ - rays

53. A β - particle in a single encounter _____
a) Loses a small fraction of its energy
b) Loses most of its energy
c) Loses no energy at all
d) Loses energy at all

54. Strontium -90 is used as _____
a) β - particle source
b) α - particle source
c) γ - particle source
d) Neutrons source

55. The penetration power of β - particle as compared to a-particle is_____
a) 10 times more
b) 100 times more
c) 100 times less
d) 10 times less

56. Geiger counter is suitable for _____
a) Fast counting
b) Extremely fast counting
c) Slow counting
d) All situations

57. An α - particle can produce fluorescence in _____
a) ZnS
b) Barium Palatino cyanide
c) Calcium tunzstate
d) All of above

58. Pair production cannot take place in vacuum as _____ is not conserved
a) Energy
b) Charge
c) Mass
d) Momentum

59. Average distance covered by α - particle in air before its ionizing power ceases is called its _____
a) Trajectory
b) Range
c) Firing level
d) Limit

60. γ - rays are electromagnetic waves like _____
a) Normal light
b) Heat waves
c) Micro waves
d) X - rays

61. β –particle ionizes an atom _____
a) Due to electrostatic force of attraction
b) Due to electrostatic force of repulsion
c) Due to direct collision
d) Due to gravitational force

62. β –particles possess greater penetration power then that of a-particle due to its _____
a) Smaller ionization power
b) Energy is not conserved
c) Neither greater nor smaller ionization power
d) Same ionization power

63. Pair production can take places only with _____
a) X-rays
b) γ - rays
c) UV-rays
d) IR-rays

64. A device for producing high velocity nuclei is _____
a) Cloud chamber
b) Linear acceleration
c) A mass spectrograph
d) Wilson cloud

65. Which one of the following will be better shield against γ - rays?
a) Ordinary water
b) Heavy water
c) Lead
d) Aluminum

66. The maximum safe limit does for persons working in nuclear power station are _____
a) 1 rem per week
b) 5 rem per week
c) 4 rem per week
d) 3 rem per week

67. Radiations are used for the treatment of skin of a patient is _____
a) α – rays
b) β – rays
c) X – rays
d) γ – rays

68. Strong nuclear force
a) Increase with magnitude of increasing charge
b) Decreases with magnitude of increasing charge
● c) Is independent of charge
d) None

69. Complete the reaction
$${}_{Z}X^{A} \rightarrow \underset{Z+1}{X} + {}_{-}\beta^{\circ} + ... + Q$$
a) Neutrino
● b) Antineutrino
c) α - particle
d) None

70. The half of uranium – 238 is
a) 1.67×10^{8} years
b) 3.3×10^{9} years
c) 4.5×10^{8} years
● d) 4.5×10^{9} years

71. The α - particle ionizes the particles in its way and adopt the path which is
● a) Curved
b) Straight
c) Zig – Zag
d) None of these

72. Which of the following is similar to electron:
a) α – rays
● b) β – rays
c) γ – rays
d) Photons

73. The rate of decay of a radioactive substance:
a) Remains constant with time
b) Increase with time
● c) Decrease with time
d) May increase or decrease with time

74. γ - rays are absorbed by a sheet of
● a) 1 to 5 mm of lead
b) 1 to 10 mm of lead
c) 5 to 10 mm of lead
d) None of these

75. Tracks obtained by β - particles in Wilson Cloud Chamber is
a) Strong Continuous
● b) Discontinuous, not straight thin
c) Weak and no definite tracks
d) None of these

76. The dead time of Geiger Muller counter is of the order of
a) Micro second
● b) Miilli second
c) More than millisecond
d) None of these

77. The breakage of $\underset{92}{\overset{235}{U}}$ produces the fragments as
a) Kr and Ba
b) Sn and Mo
c) Xe and Sr
● d) All of them

78. The fuel / fuels used in the reactor are nowadays
a) Plutonium – 239
b) Uranium – 233
c) Uranium – 235
● d) All of these

79. The temperature of the core of the reactor rises to about
● a) $1000^{o}C$
b) $1100^{o}C$
c) $1200^{o}C$
d) $1300^{o}C$

80. Plutonium can be fissioned by
a) Slow neutron
● b) Fast neutron
c) Very slow neutron
d) None of these

81. Ultraviolet radiation cuase
a) Sum burn
b) Blindness
c) Skin Cancer
● d) All of them

82. Neutrons are particularly more damaging to
a) Legs
b) Heart
c) Eyes
d) Brain

83. Radio isotopes can be made easily by bombardment with
a) Electrons
b) Protons
● c) Neutrons
d) None of these

84. Subatomic particles are divided into
a) Photons
b) Leptons
c) Hadrons
● d) All of these

85. One amu is equal to _____
- a) 931 MeV
- b) 9.31 MeV
- c) 93.1 MeV
- d) 0.931 MeV

86. Cobalt -60 emits γ −rays of energy _____
- a) 117 MeV
- b) 11.7 MeV
- c) 1.17 MeV
- d) 1.17 KeV

87. Which of the following statements is correct?
- a) Moderators slow down the neutrons
- b) Moderators bring the neutrons to rest
- c) Moderators absorbs the neutrons
- d) Moderators reflect the neutrons

88. The half life of radioactive element is _____
- a) $T_{1/2} = \frac{0.693}{\lambda}$
- b) $T_{1/2} = 1.43\ \lambda$
- c) $T_{1/2} = 0.693\ \lambda$
- d) $None\ of\ these$

89. Hadrons are the particle included
- a) Protons
- b) Neutrons
- c) Mesons
- d) All of these

90. Lepton's particles which experience no strong nuclear force are
- a) Electrons
- b) Muons
- c) Neutrinos
- d) All of these

91. The charges on the quarks are
- a) One unit
- b) Half unit
- c) Fraction
- d) None of these

92. Meson is made from
- a) A pair of quarks
- b) A pair of anti quarks
- c) A pair of quarks and anti quarks
- d) None of these

93. Fission nuclear reaction leads to_____ stability.
- a) Lesser
- b) Greater
- c) Medium
- d) None

94. If a radioactive isotope of silver have a half life of about 7.5 days. After 15 days the remaining isotope of its original is
- a) 25%
- b) 50%
- c) 7.5%
- d) 15%

95. A nuclide ${}_{86}R^{220}$ decays to a new nuclide by two α -emissions, the nuclide S is
- a) ${}_{84}S^{212}$
- b) ${}_{82}S^{212}$
- c) ${}_{80}S^{220}$
- d) None

Key Chapter # 21

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	a	33	c	65	c
2	a	34	c	66	b
3	c	35	b	67	b
4	a	36	b	68	c
5	a	37	a	69	b
6	b	38	d	70	d
7	c	39	b	71	b
8	c	40	c	72	b
9	a	41	b	73	c
10	b	42	b	74	b
11	a	43	d	75	b
12	c	44	c	76	b
13	d	45	d	77	d
14	b	46	b	78	d
15	b	47	d	79	a
16	a	48	b	80	b
17	a	49	d	81	d
18	c	50	b	82	
19	c	51	c	83	c
20	a	52	a	84	d
21	a	53	a	85	a
22	b	54	a	86	c
23	d	55	b	87	a
24	d	56	c	88	a
25		57	d	89	d
26	d	58	d	90	d
27	c	59	b	91	c
28	a	60	d	92	c
29	d	61	b	93	b
30	a	62	a	94	a
31	a	63	b	95	b
32	c	64	b		