Padasalai's Telegram Groups!

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- Lesson Plan - Group
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PHYSICS 12th
VOLUME-I

IMPORTANT QUESTION & ANSWER

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MANNARGUDI 614-001

2 & 3 MARKS

Lesson-1

01.give the relation between electric field and electric potential

$$E = -dv/dx$$

The electric field is equal to the negative gradient of the electric potential

02.what are the properties of electric line of force.

- The electric field lines are start from a positive charge and end with negative
- The electric field vector at a point in space is tangential to the electric field line at the point

03.define electric dipole

Two equal and opposite charges separated by a small distance constitute an electric dipole EX; water ,ammonia

04.define equi-potential surface

An equipotential surface is a surface on which all the points are at the same potential

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05.Define electric flux .

The number of electric field lines are crossing a given area kept normal to the electric field lines is called electric flux

06.what are the difference between coulomb force and gravitational force

Gravitational force	Coulomb force
❖ it is always attractive	❖ It can be attractive or repulsive depends on nature
❖ The value of gravitational constant $G=6.626\times10^{-11}Nm^2Kg^{-2}$	❖ the value of Proportionality constant $K=9\times10^{9}Nm^2C^{-2}$
❖ it is in independent in medium which it exit	❖ it is depends on medium which it exist

07.what is polarisation ?

Polarisation is defined as the when a dielectric material placed in a uniform electric field the dipole moment are aligned in the field direction

08.state coulomb's law ?

Coulomb's law state that the force of attraction or repulsion between two point charges is directly proportional to the product of the charge and inversely proportional to the square of the distance between them .

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09.define one coulomb?

One coulomb is defined as the quantity of the charge ,which when placed at a distance of 1 meter in air or vacuum from an equal and similar charge experience a repulsive force 9×10^9 N

10.what is capacitance?

conductor plates to the potential difference existing between the conductors It is defined as the ratio of the magnitude of charge on either of the

11.Write the application of capacitors?

- They are used in the ignition system of automobile engines to eliminate sparking
- They Are used to reduce voltage fluctuations in power supplies and to increase the efficiency of power transmission
- Capacitors are used to the generate electromagnetic oscillation and in tuning the radio circuit

12.Define current density.

- The current density is defined as the current per unit area of cross section of the conductor
- J=I/A
- S.I unit in A/M^2

13.Define 1 ampere.

- passing through a perpendicular cross section in 1second 1A of current is equivalent to 1 coulomb of charge

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14.Distinguish between polar and non-polar molecule ?

Polar molecules	Non-polar molecules
❖ A polar molecule is one in which the centre of gravity of the positive charge is separated from the centre of gravity of the negative charges by a finite distance	❖ Non-polar molecule is one in which the centre of gravity of the positive charge coincide with the centre of gravity of the negative charges
❖ They have a permanent dipole moment	❖ They don't have a permanent dipole moment
EXAMPLE;N_2O, H_2O.	EXAMPLE;O_2,N_2,H_2

Lesson-2

15.state ohm's law.

The constant temperature a study current flow through a conductor is directly proportional to the potential difference between the two end of the conductor .it is called ohm's law

16.What is seebeck effect .

- In a closed circuit consisting of two dissimilar metals, an emf is developed when the junctions are maintained at different temperatures .this is called seebeck effect

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17.what is meant by peltier effect

Then current allowed to pass through a thermo couple heat is evolved at one junction and absorbed at another junction

18.Define mobility.

- The mobility of the electron and it is defined as the magnitude of the drift velocity per unit electric field
- $\mu = \left|\overrightarrow{Vd}\right| / \underset{|E|}{\rightarrow}$
- The S.I unit of mobility is m^2/Vs

19.Define resistance .

- The resistance is the ratio of the potential difference across the given conductor to the current passing through the conductor

20.How can you calculate the value of resistor are connected in parallel.

The resistor connected in parallel the resultant resistance is the sum of the reciprocal of it's individual resistance

21.state Kirchhoff's current rule.

- Kirchhoff's current rule states that the algebraic sum of the currents meet at any junction of a circuit is zero
- i.e $\sum$ i=0
  junction
- it is a statement of conservation of electric charge

22.state Kirchhoff's voltage rule.

- Kirchhoff's voltage rule states that in a closed circuit, the algebraic sum of the products of the current and resistance

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of each part of the circuit is equal to the algebraic sum of emf in the same circuit

- i.e $\sum_{\text{closed loop}} \Delta v = 0$
- It follows the law of conservation of energy

23.Distinguish between drift velocity and mobility .

	DRIFT VELOCITY	MOBILITY
1.	It is defined as the average velocity acquired by the electrons inside the conductor when an electric field is applied	It is defined as the magnitude of drift velocity per unit electric field
2.	$V_d = a\tau$	$\mu = e\tau/m$
3	Unit is ms^{-1}	Unit is $m^2 V^{-1} S^{-1}$

24.What is electric power and electric energy.

Electric Energy :

- Electric potential energy gained by the charge carries as they move through potential difference v is dw =v Dq
- dw=P dt
- unit:1K Wh

Electric Power:

- Electric power is the rate at which energy is transformed P=dw/dt

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- P=VI
- Unit:Watt

25.what is Thermoelectric effect?

- Conversion of temperature differences into electrical voltage and vice versa is known as thermoelectric effect

Lesson-3

26.state coulomb's inverse law.

- The force of attraction or repulsion between two magnetic poles is directly proportional to the product of their pole strength's and inversely proportional to the square of the distance between them,
- $\overrightarrow{F} \propto qmA\ qmB/r2 \times \hat{r}$
- m^A&m^B-pole strengths of two poles, r-distance between two magnetic poles

27.How to convert a galvanometer into voltmeter.

- Voltmeter must have high resistance
- Galvanometer convert into voltmeter by connecting the high resistance in series

28.state Ampere's circuital law.

- The line integral of magnetic field over a closed loop is μ_0 times net current enclosed by loop
- $\oint_C \vec{B}.d\vec{l}=\mu 0\ I$ enclosed
- I enclosed →net current in the closed loop c

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29.define tangent law

When a magnetic needle or magnet is freely suspended in two mutually perpendicular to the uniform magnetic field it will come to rest in the direction of the resultant of the two fields

30.what is meant by magnetic induction?

- The process by which an object or material is magnetized by an external magnetic field
- S.I unit of magnetic induction is tesla(T)

31.what is magnetic permeability?

Measure of the capacity of the substance to take magnetisation.

32.what is meant by hysteresis?

- Lagging of magnetic induction behind the magnetic field.
- Hysteresis means lagging behind.

33.what are the properties of paramagnetic material's?

- Magnetic susceptibility is positive and small
- Relative permeability is greater than unity
- The magnetic lines are attracted into the paramagnetic materials when placed in a magnetic field
- Susceptibility is inversely proportional to temperature

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Lesson-4

34.What is mean by electromagnetic induction?

- Whenever the magnetic flux linked with the closed coil changes, an emf is induced and hence an electric current flows in the circuit
- This current is called an induced current an emf giving rice to such current is called an induced emf
- This phenomenon is electromagnetic induction.

35.State Faraday's law of electromagnetic induction.

First law :

- Whenever the magnetic flux linked with a closed circuit changes, an emf is induced in circuit

Second law:

- The magnitude of induced emf in a closed circuit is equal to the rate of change of magnetic flux linked with the circuit

36.state lens law

The direction of induced current always oppose the cause responsible for it's production

$\varepsilon = -d\varphi/dt$

37.what is the principle of cyclotron

When a charged particles moves normal to the magnetic fields it experience magnetic lorent'z force

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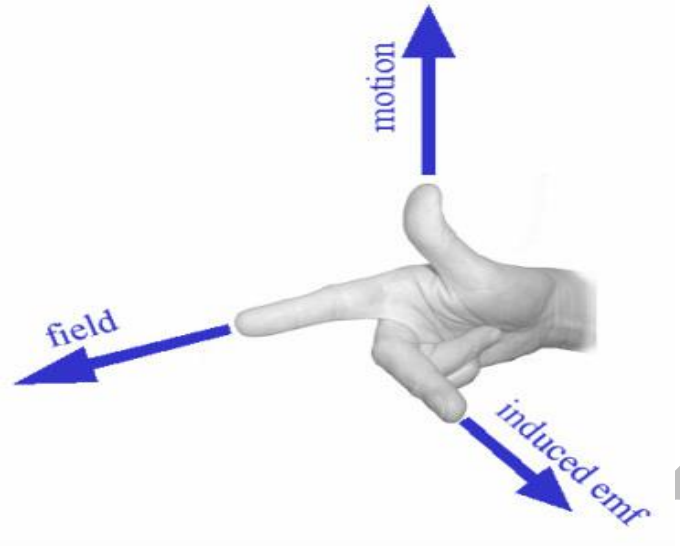
38.state Fleming's right hand rule .



- the Thumb,index finger,and middle finger of Right hand are stretched perpendicular to each other.
- Thumb finger indicate the direction of motion of the conductor
- Index finger indicate the direction of magnetic field
- Middle finger indicate the direction of induced current

39.How is Eddy current produced? How do they flow in a conductor?

- For a conductor in the form of a sheet or plate an emf is induced when the magnetic flux linked with it changes
- The induced current is flow in concentric circular path
- These electric current resemble eddies of water these are known as Eddy current

40.what is meant by self-induction? Give it's unit.

- When magnetic flux is changed by changing current in the coil ,an induced emf is induced in the same coil

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- This is known as self-induction [UNIT; Hendry]

41.What is meant by mutual induction?

- When an electric current passing through a coil changes with time, an emf is induced in the neighbouring coil .This is known as mutual induction.

42.Give the principle of AC generator.

- AC generator works on the principle of electromagnetic induction
- The relative motion between a conductor and a magnetic field changes the magnetic flux linked with the conductor which in turns, induces an emf

43.list out the advantage of the stationary armature-rotating field systems of AC generator.

- Current is drawn directly from fixed terminal's on stator without use of brush contact.
- Insulation of stationary armature winding is easy.
- The number of sliding contacts [slip ring] is reduced
- Armature windings can be constructed more rigidly to prevent deformation.

44.What are step-up & step-down transformers?

- The transformer convert an alternating current with low voltage into an alternating current with high voltage is called step-up transformer
- The transformer convert an alternating current with high voltage into an alternating current with low voltage is called step-down transformer.

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45.Define average value of an alternating current .

- The average value of an alternating current is defined as the average of all values of current over a positive or negative half-cycle

46.How will you define Q-factor.?

- Q-factor is defined as the ratio of voltage across L or C the applied voltage
- Q-factor =voltage across L or C/Applied voltage
- Q-factor=1/R $\sqrt{L/C}$

47.Give any one definition of power factor.

❖ **Power factor is defined as**

- Power factor=cos φ=cosine of the angle of lead or lag
- Power factor =R/Z=Resistance/impedance
- Power factor= true power/apparent power

48.Define magnetic flux.

- the magnetic flux through on area A in magnetic field is defined as the number of magnetic field lines passing through that area.

$\varphi B = \int A\,\vec{B}\,.\,d\vec{A} = BA\cos\theta.$

49.What are the application of Eddy current.?

- Induction stave
- Electromagnetic damping
- Eddy current brake
- Eddy current testing

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50.Define Transformer.

Transformer is a stationary device is used to increasing (or) decreasing electric potential to transform a electric power

51.Define alternating current.

An alternating voltage is the voltage which changes polarity at regular interval of time and the direction of the resulting alternating current also changes accordingly.

52.How will you define the RMS value of AC.

RMS value is also defined as that value of the steady current which when flowing through a given circuit for a given time produces the same amount of heat a produced by the alternating current when flowing through the same circuit for the same time

53.Define one Hendry in terms of flux.

The inductance of the coil is said to be one Hendry if a current of $1AS^{-1}$ Induce an opposing emf of 1v in it.

54.Define the principle of the Transformer.

- The principle of transformer is mutual induction between two coils
- When electric current passing through a coil changes with time, an emf is induced in neighbouring coil

55.write ant two points of three phase alternator

- three phase alternator produce high power output compare with single phase alternator.
- the same capacity three phase alternator smaller in size

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56.what are LC oscillations.

- Whenever energy is given to a circuit containing a pure inductor(L) and capacitor(C),
- the energy oscillates back and forth between magnetic field of inductor and electric field of capacitor.
- Thus electric oscillation of definite frequency are generated.
- This oscillations are called LC oscillations.

Lesson-5

57.What is displacement current?

The current which comes into play in the region in which the electric field and the electric flux are changing with time

58.What are electromagnetic waves?

The transvers wave produce by accelerated charge and non-mechanical wave do not require any medium for propagation of electromagnetic waves.

59.What is meant by intensity?

The energy crossing per unit area per unit time and perpendicular to the direction of propagation of electromagnetic waves is called intensity.

60.Give the uses of infrared radiation (IR)?

- To produce dehydrated fruits
- In green house to keep the plants warm
- Heat therapy for muscular form
- TV remotes as signal corner
- In night vision photography

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61.Give the uses of ultraviolet radiation(UV)?

- To destroy bacteria
- In burglar alarm
- To study molecular structure
- To sterilizing surgical instrument
- Detect the invisible writing, finger prints

62.what is emission spectra ,Give their types?

- The spectrum of the self-luminous source is taken we get emission spectra
- Each source has it's own characteristics of emission spectra
- Emission spectra divided into Three type
  - Continues emission spectra
  - Line emission spectra
  - Band emission spectra

63.What is meant by electromagnetic spectrum?

The orderly distribution of electromagnetic radiation of all types according to their wavelength or frequency into distinct groups is called electromagnetic spectrum.

64.Give the uses of X-rays ?

- To study the inner atomic electron shells and crystals structures
- Observing the progress of healing bones
- Used to detect the fractures
- Used to detect faults, cracks, flaws, and holes .

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