
Vizle

solutions will not carry any marks.

PART- A

I. Answer any TEN of the following questions: **10 × 1 = 10**

1. Write the physical quantity, whose SI unit is 'coulomb'.
   Ans:- **Charge**

2. Define linear charge density.
   Ans:- **Linear density of charge is charge per unit length.**

3. How does resistivity of the nichrome vary with absolute temperature?
   Ans:- **Linearly**
   As the temperature increases the resistivity increases linearly.

4. The coloured rings marked on a carbon resistor are Red, Red, Red, and Silver. What is the tolerance of this resistor?
   Ans:- **$22 \times 10^2 \pm 10\%$**

5. What is Lorentz force?

8. What is wattles current?

Ans:- **The AC current through pure L and C circuit is called wattles current.**

Or

It is the current in the circuit for which the power dissipation is zero

9. Mention the angle between electric field and magnetic field in an electromagnetic wave.

Ans:- **90^0**

10. Name the electromagnetic wave which keeps the Earth warm by greenhouse effect.

Ans:- **Infrared rays (IR - rays)**

11. Write the condition for diffraction maxima in terms of wavelength of light and slit width.

Ans:- $\theta = \left(n + \frac{1}{2}\right)\frac{\lambda}{d}$

Where θ is the angular position of the bright fringe,

n = 1, 2, 3 .....

λ is the wave length of light used,

d is the slit width.

PART- B

II. Answer any FIVE of the following questions: **5 × 2 = 10**

16. Write any two differences between polar and non-polar molecules.

Ans:-

Polar molecule	Non-Polar molecule
1. These are the molecules in which	1. These are the molecules in which

	field.
Ex: HCL, CO, H_2O NH_3 , etc	Ex: H_2, N_2, O_2, CO_2, CH_4, CCl_4, etc.

17. State Ohm's law and write its one limitation.

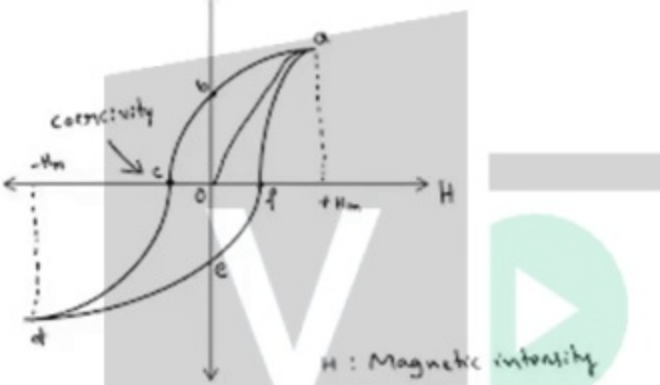
Ans:- **Ohm's law states that the current (I) flowing through a conductor is directly proportional to the potential difference (V) applied across its ends, provided the temperature and other physical conditions remain constant".**

I.e. I or V = IR

Limitations of Ohm's law:

1. **Ohm's law applicable only for good conductors.**
2. **Ohm's law applicable only, when the physical conditions like temperature, pressure and tension remains constant.**
3. **Ohm's law is not applicable at very low temperature and very high temperature.**
4. **Ohm's law is not applicable for semiconductors, thermistors, vacuum tubes, discharge tubes. (Any one)**

18. Define magnetic declination and inclination of the Earth.



20. What is displacement current? Write its expression.

Ans:- **The electric current due to changing electric field is called displacement Current.**

$$I_d = \varepsilon_0 \frac{d\phi}{dt}$$

Where ε_0 **is the permittivity of free space,**

$\frac{d\phi}{dt}$ **is the rate of change of electric flux.**

23. Find the potential difference through which an electron be accelerated so that its de Broglie's wavelength becomes 0.1227 nm.

Ans:-

Sol^n :-

de-Broglie wave equation

$$\lambda = \frac{1.227}{\sqrt{V}} nm$$

$$0.1227 = \frac{1.227}{\sqrt{V}}$$

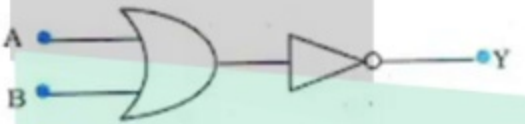
$$\sqrt{V} = \frac{1.227}{0.1227} = 10$$

ii) The relativistic variation of mass is not taken into account in the theory.

iii) The fine structure of spectral lines cannot be accounted for.

iv) The theory fails to account for relative intensities of spectral lines (any two)

25. In the following circuit, if *A=1* and *B=1*, What is the value of Y? Name the equivalent logic gate that this circuit represents



Ans:- Y = 0

NOR gate