-------------------------------------------------5th Chapter--------------------------------------------------------------

1. Magnetic flask, φ **= ? (Physics 2nd paper by Tapan | Page: 157 | FIG: 5.4 a,b)**

**Hints: A = Area of a bottom, B = The magnetic field along the perpendicular to the bottom**

1. φ = AB cos θ (ans.)
2. φ = AB sin θ
3. φ = AB tan θ
4. φ = ×

Prove:

If a lower field a field and a magnetic field along the perpendicular to that bottom [Figure 5.4 (a)] then magnetic flask φ = A B

But if the magnetic field acts at θ angle with the perpendicular inthe not acting along the perpendicular to the bottom [Figure 5.4 (b)] then the magnetic field along the perpendicular to that bottom will be the subsection B cos θ. So the magnetic flask will be,

φ = AB cos θ

1. Faraday’s Laws of Electromagnetic Induction, ε = ?

Hints: ε = Occupied electrical energy, φ1 = A magnetic flask passing through a closed coil or circuit at a given moment, φ2 = Magnetic flask passed through a coil or circuit over t time, K = Proportional constant, t = time

A. ε = - K (φ2 – φ1­) / t (ans.)

B. ε = K (φ2 – φ1­) / t

C. ε = - K (φ1 – φ2­) / t

D. ε = - K (φ2 – φ1­) × t

Ans: ε = - K (φ2 – φ1­) / t

Prove:

Faraday’s second law: The value of the electromagnetic force in a closed coil is proportional to the negative value of the rate of change of the magnetic flask passing through that coil.

Let's say,

φ1 = A magnetic flask passing through a closed coil or circuit at a given moment

φ2 = Magnetic flask passed through a coil or circuit over t time

Thus, the change of magnetic flux at t = φ2 - φ1 And the rate of change of the magnetic flux = (φ2 - φ1) / t

The electromotive force, according to Faraday's second law,

ε ∝ (φ2 - φ1) / t

or, ε = - K (φ2 - φ1) / t

1. Which one is the correct formula of Lenz’s Law?

Hints:

A. ε = - N (ans.)

B. ε = N

C. ε =

D. ε = -

Ans: - N

Prove: The lenz formula is: In the case of any electromagnetic obsession, the direction of electrical energy or flow is such that it prevents it from being created as soon as it is created.

So from the lenz formula we can know the direction of the current power and flow. Thereby, ε = - N

1. Formula of εp ?

Hints:

A. εp =  - Np (ans.)

B. εp = - N

C. εp = -

D. εp =

Ans: - Np

Prove:

Let's say, applying εp changed potential to the main coil led to the flow of Ip in this coil. This flow magnetises the contents and produces magnetic field lines. Now the pak number of the main kundali is Np and if the magnetic flask attached to each pak is φ then,

- Np

1. Which one is the correct formula?

Hints:

A.  = = (ans.)

B.  = =

C.  = =

D.  = =

Ans:  = =

Prove:

We know, = … …(i)

According to the continuity formula of energy, the capacity of both the coils of the transformer will be equal i.e. the energy spent per second in the main coil will be equal to the energy generated per second in the secondary coil.

That is, incoming power = outgoing power

Therefore, εpIp = εsIs

or, = … …(ii)

From equation (i) and (ii),

= =

1. Formula of ω = ?

Hints: ω = Angular velocity of the source, T = period, R = resistance, ε = The value of electrical energy covered in t, f = frequency

A. ω = (Ans.)

B. ω =

C. ω = R

D. ω = ε

Ans:

Prove:

1. Formula of ω = ?

Hints: ω = Angular frequency of electrolysis, T = period, R = resistance, ε = The value of electrical energy covered in t, f = frequency

A. ω = 2πf (ans.)

B. ω =

C. ω = R

D. ω = ε

Ans: ω = 2πf

Prove:

1. Formula of T = ?

Hints: ω = Angular frequency of electrolysis, T = period, R = resistance, ε = The value of electrical energy covered in t, f = frequency

A. T = (ans.)

B. T =

C. T =

D. T =

Ans: T =

Prove:

We know,

ω =

or, T =

1. Formula of f = ?

Hints: ω = Angular frequency of electrolysis, T = period, R = resistance, ε = The value of electrical energy covered in t, f = frequency

A. f = (ans.)

B. f =

C. f =

D. f =

Ans: f =

Prove:

We know, ω = 2πf

Or, f =

1. Formula of electric current, I = ?

Hints: ε = Occupied electrical energy, R = resistance, ω = Angular frequency of electrolysis, t = time

A. I = (ans.)

B. I =

C. I = ω

D. I =

Ans: I =

Prove:

1. Formula of electric current, I = ?

Hints: ε = Occupied electrical energy, R = resistance, ω = Angular frequency of electrolysis, t = time

A. I = (ans.)

B. I =

C. I = sin ωt

D. I =

Ans: I =

Prove:

I = =

1. Which of I’s value is correct for the average current for the half cycle?

Hints: I = the average current for the half cycle, I0 = Top value of electric current, T = period

A. I = 0.637 I0 (ans.)

B. I = 0.617 I0

C. I = 0.673 I0

D. I = 0.067 I0

Ans: I = 0.637 I0

Prove:

If the periodic is T, we know that the average current for the half cycle will be,

I =

=

= - [ cos

= - [ cos

= - [ cos π – cos 0 ] [ ]

= - [ -1 -1 ] =

So, I = 0.637 I0

1. What will be the average square value of electric current for a full cycle?

Hints: = the average square value of electric current for a full cycle, I0 = Top value of electric current, T = period, ω = Angular frequency.

A. = (ans.)

B. =

C. = 0.637 I0

D. = -

Ans: =

Prove:

The average value of electric current for a full cycle will be when the periodic T is,

=

We know, direction allot flow I is

I = I0 sin ωt

Here, I0 = top value of electric current.

ω = Angular frequency.

Therefore, = =

= dt [ ]

=

=

=

=

=

So, =

1. Which of the following is the square basic average value of the directional current?

Hints: Irms = square basic average value of the directional current, = the average square value of electric current for a full cycle

A. Irms = I0 (ans.)

B. Irms = I0

C. Irms = 0.637 I0

D. Irms = I0

Ans: Irms = I0

Prove:

The average quality square root of the square of the directional current-current is called the square basic average value or effective or apparent flow of the directional electric current. So,

Irms = = = = 0.707 I0 = I0

1. Formula of power, P = ?

Hints: P = Power, I = electric current, R = resistance, V = voltage

A. P = I2R (ans.)

B. P =

C. P =

D. P = IR

Ans: P = I2R

Prove:

We know that when an electric current flows through a resistor, electrical energy is converted into heat energy. The rate of thermal energy conversion is defined as capacity P. So,

P = I2R

1. What is the value of shape coefficient?

Hints: The ratio of square root value and average of the average square of the directional electric power or flow is called shape coefficient.

A. Shape coefficient = 1.11 (ans.)

B. Shape coefficient = 1.10

C. Shape coefficient = 0.11

D. Shape coefficient = 1.01

Ans: Shape coefficient = 1.11

Prove:

Shape coefficient =

= = = = 1.11