1. Ohm's law for magnetic circuits is _____

a) $F=\phi S$

b) $F=\phi/S$

c) $F=\phi^2 S$

d) $F=\phi/S^2$

View Answer

Answer: a

Explanation: Ohm's law for magnetic circuits states that the MMF is directly proportional to the magnetic flux where reluctance is the constant of proportionality.

2. What happens to the MMF when the magnetic flux decreases?

a) Increases

b) Decreases

c) Remains constant

d) Becomes zero

View Answer

Answer: b

Explanation: Ohm's law for the magnetic circuit's states that the MMF is directly proportional to the magnetic flux hence as the magnetic flux decreases, the MMF also decreases.

3. Calculate the MMF when the magnetic flux is 5Wb and the reluctance is 3A/Wb.

a) 10At

b) 10N

c) 15N

d) 15At

View Answer

Answer: d

Explanation: We know that:

$F=\phi S$

Substituting the given values from the question, we get MMF = 15At.

4. A ring having a cross-sectional area of 500 mm^2, a circumference of 400 mm and ϕ=800microWb has a coil of 200 turns wound around it. Calculate the flux density of the ring.

a) 1.6T

b) 2.6T

c) 3.6T

d) 4.6T

View Answer

Answer: a

Explanation: ϕ=BA => Flux density B = ϕ/A

Substituting the values, we get B=1.6T.

5. A ring having a cross-sectional area of 500 mm^2, a circumference of 400 mm and ϕ=800microWb has a coil of 200 turns wound around it. Relative permeability of ring is 380. Calculate the reluctance.

a) $1.68 * 10^{-4}$A/Wb

b) $1.68 * 10^{4}$ A/Wb

c) $1.68 * 10^{6}$ A/Wb

d) $1.68 * 10^{-6}$A/Wb

View Answer

Answer: c

Explanation: Reluctance=$l/(\mu*A) = l/(\mu_r\mu_0*A)$

Substituting the values, we get Reluctance=$1.68*10^{6}$ A/Wb.

7. A ring having a cross-sectional area of 500 mm^2, a circumference of 400 mm and ϕ=800microWb has a coil of 200 turns wound around it. Relative permeability of ring is 380. Calculate the magnetising current.

a) 6.7A

b) 7.7A

c) 7.6

d) 6.1A

View Answer

Answer: a

Explanation: Reluctance = $l/(\mu*A) = l/(\mu_r\mu_0*A)$

Substituting the values, we get Reluctance S=1.68*106 A/Wb.

$F=\phi S$ Substituting the given values, we get F = 1344At.

I=F/N Substituting the values from the question, we get I=6.7A.

8. Can we apply Kirchhoff's law to magnetic circuits?

a) Yes

b) No

c) Depends on the circuit

d) Insufficient information provided

View Answer

Answer: a

Explanation: Magnetic circuits have an equivalent to the potential difference of electric circuits. This is the magnetic potential difference which allows us to apply Kirchhoff's laws to magnetic circuit analysis.

9. What is MMF?

a) Magnetic Machine Force

b) Magnetomotive Force

c) Magnetic Motion Force

d) Magnetomotion Force

View Answer

Answer: b

Explanation: MMF stands for magnetomotive force. Actually, it is not a force. It is analogous to potential in electric field.

10. The equivalent of the current I in magnetic ohm's law is?

a) Flux

b) Reluctance

c) MMF

d) Resistance

View Answer

Answer: a

Explanation: The equivalent of current in magnetic ohm's law is flux as:

V=IR is equivalent to F=ϕS.

1. The B/H characteristics can be determined using _____

a) Ammeter

b) Fluxmeter

c) Voltmeter

d) Multimeter

View Answer

Answer: b

Explanation: The fluxmeter is an electronic display instrument used to measure the magnetic flux of permanent magnets hence it can be used to determine B/H characteristics.

2. The B/H curve can be used to determine?

a) Iron loss

b) Hysteresis loss

c) Voltage loss

d) Eddy current loss

View Answer

Answer: b

Explanation: Hysteresis loss is basically a heat loss due to the reversal of magnetisation of the transformer core whenever it is subjected to a changing magnetic field. It can be determined using the B/H curve.

3. The B/H ratio is not constant for _____

a) Diamagnetic materials

b) Ferromagnetic materials

c) Paramagnetic materials

d) Non-magnetic materials

View Answer

Answer: b

Explanation: As the magnetizing field increases, the relative permeability increases, reaches a maximum, and then decreases. Due to varying permeability, B/H ratio is not constant for ferromagnetic materials.

4. When using a fluxmeter, if the flux changes from Φ to -Φ, what happens to the current?

a) Becomes zero

b) Becomes infinity

c) Remains the same

d) Reverses

View Answer

Answer: d

Explanation: When the flux changes from Φ to -Φ, the current direction will change as the direction of flux is changing.

8. Hysteresis loss is determined from _____

a) B/H curve

b) H/B curve

c) BH curve

d) B^2H curve

View Answer

Answer: c

Explanation: Hysteresis loss is basically a heat loss due to the reversal of magnetisation of the transformer core whenever it is subjected to a changing magnetic field. It can be determined using the B/H curve.

10. B/H curve shows the relationship between?

a) Magnetic field strength and magnetic flux

b) Magnetic field strength and magnetic flux density

c) Current and magnetic flux density

d) Voltage and magnetic flux density

View Answer

Answer: b

Explanation: The B/H curve shows the relation between magnetic field strength and magnetic flux density.

1. In case of Inductive circuit, Frequency is _____ to the inductance.

a) Directly proportional

b) Inversely proportional

c) Unrelated

d) Much greater than

View Answer

Answer: b

Explanation: The formula for frequency in an inductive circuit is:

$X_L=2*\pi*f*L$.

Therefore: f is inversely proportional to L.

1. Among the following, which is the right formula for inductance?

a) L=emf*t/I

b) L=emf/t*I

c) L=emf*I/t

d) L=emf*t*I

View Answer

Answer: a

Explanation: The average emf induced is proportional to the current per unit time, the constant of proportionality being L. Hence emf=LI/t. Making L the subject of the formula, we get L=emf*t/I.

2. Among the following, which is the right formula for inductance of N turns?

a) L=et/Ni

b) L=N*i *e*t

c) L=Ni/et

d) L=N/iet

View Answer

Answer: a

Explanation: We know that:

emf=NLi/t

Inductance = L = et/N.

3. For a coil having a magnetic circuit of constant reluctance, the flux is _____ to the current.

a) Directly proportional

b) Inversely proportional

c) Not related

d) Very large compared to

View Answer

Answer: a

Explanation: For a coil having a magnetic circuit of constant reluctance, the flux is directly proportional to the current.

4. For a coil having a magnetic circuit of constant reluctance, if the flux increases, what happens to the current?

a) Increases

b) Decreases

c) Remains constant

d) Becomes zero

View Answer

Answer: a

Explanation: For a coil having a magnetic circuit of constant reluctance, the flux is directly proportional to the current. Hence as the flux increases, the current also increases.

6. If either the inductance or the rate of change of current is doubled, the induced e.m.f?

a) Remains constant

b) Becomes zero

c) Doubles

d) Becomes half

View Answer

Answer: c

Explanation: If either the inductance or the rate of change of current is doubled, the induced e.m.f. becomes double because of emf=LI/t.

7. If the current changes from 5A to 3A in 2 seconds and the inductance is 10H, calculate the emf.

a) 5V

b) 10V

c) 15V

d) 20V

View Answer

Answer: b

Explanation: We know that:

emf=L(i2-i1)/t

Substituting the values from the question, we get emf=10V.

8. If the current changes from 5A to 3A in x sec and inductance is 10H. The emf is 10V, calculate the value of x.

a) 2s

b) 3s

c) 4s

d) 5s

View Answer

Answer: a

Explanation: We know that:

emf=L(i2-i1)/t

Substituting the values from the question, we get x=2s.

1. Reciprocal of reluctance is _____

a) Permeance

b) Susceptibility

c) Resistance

d) Conductance

View Answer

Answer: a

Explanation: The reciprocal of reactance is permeance. It is the ability of a material to allow the passage of magnetic lines of flux.

2. Reluctance is _____ to the length of the material.

a) Directly proportional

b) Inversely proportional

c) Not related

d) Reluctance is _____ to the length of the material.

View Answer

Answer: a

Explanation: The formula for reluctance is:

$S = l/\mu_0 \mu_r * A$.

From the formula, we can see that reluctance is directly proportional to the length of the material.

3. Reluctance is _____ to the area of cross section the material.

a) Directly proportional

b) Inversely proportional

c) Not related

d) Equal

View Answer

Answer: b

Explanation: The formula for reluctance is:

$S = l/(\mu_0 \mu_r * A)$.

From the formula, we can see that reluctance is inversely proportional to the area of cross section of the material.

9. If the current changes from 3A to 5A in 2s and the emf is 10V. Calculate the inductance.

a) 10H

b) 20H

c) 30H

d) 40H

View Answer

Answer: a

Explanation: If the current changes from 5A to 3A in 2s and the emf is 10V. Calculate the inductance.

4. When the length of the material increases, what happens to reluctance?

a) Increases

b) Decreases

c) Remains the same

d) Becomes zero

View Answer

Answer: a

Explanation: Reluctance is directly proportional to the length of the material hence as length increases, reluctance also increases.

5. When the area of cross section of the material increases, what happens to reluctance?

a) Increases

b) Decreases

c) Remains the same

d) Becomes zero

View Answer

Answer: b

Explanation: Reluctance is inversely proportional to the area of cross section of the material hence as area increases, reluctance decreases.

6. Unit of reluctance is?

a) AWb

b) A^2/Wb

c) Wb/A

d) A/Wb

View Answer

Answer: d

Explanation: Reluctance is magnetomotive force per unit flux,

So unit of reluctance = unit of MMF / unit of magnetic flux = A/Wb.

7. The electrical equivalent of reluctance is?

a) Resistance

b) Inductance

c) Capacitance

d) Conductance

View Answer

Answer: a

Explanation: Resistance is the opposition to the flow of charge, similarly reluctance is the opposition to the flow of magnetic flux.

8. As the magnetic field strength increases, reluctance?

a) Increases

b) Decreases

c) Remains the same

d) Becomes zero

View Answer

Answer: a

Explanation: Reluctance is directly proportional to the strength of the magnetic field, hence as the strength of magnetic field increases, the reluctance increases.

9. As the magnetic flux density increases, the reluctance _____

a) Increases

b) Decreases

c) Remains the same

d) Becomes zero

View Answer

Answer: b

Explanation: Reluctance is inversely proportional to the magnetic flux density, hence as magnetic flux density increases, reluctance decreases.

10. Calculate the reluctance when the magnetomotive force is 10A turns and the flux is 5Wb.

a) 0.5A/Wb

b) 5A/Wb

c) 10A/Wb

d) 2A/Wb

View Answer

Answer: d

Explanation: We know that:

$F=\phi*S$

Substituting the given values from the question:

$S=2A/Wb.$

1. Biot Savart law in magnetic field is analogous to which law in electric field?

a) Gauss law

b) Faraday law

c) Coulomb's law

d) Ampere law

View Answer

Answer: c

Explanation: Biot Savart law states that the magnetic flux density H = I.dl $\sin\theta/4\pi r^2$, which is analogous to the electric field F = $q1q2/4\pi\varepsilon r^2$, which is the Coulomb's law.

2. Which of the following cannot be computed using the Biot Savart law?

a) Magnetic field intensity

b) Magnetic flux density

c) Electric field intensity

d) Permeability

View Answer

Answer: c

Explanation: The Biot Savart law is used to calculate magnetic field intensity. Using which we can calculate flux density and permeability by the formula B = μH.

3. Find the magnetic field of a finite current element with 2A current and height 1/2π is

a) 1

b) 2

c) 1/2

d) 1/4

View Answer

Answer: a

Explanation: The magnetic field due to a finite current element is given by H = I/2πh. Put I = 2 and h = 1/2π, we get H = 1 unit.

4. Calculate the magnetic field at a point on the centre of the circular conductor of radius 2m with current 8A.

a) 1

b) 2

c) 3

d) 4

View Answer

Answer: b

Explanation: The magnetic field due to a point in the centre of the circular conductor is given by $H = I/2a$. Put $I = 8A$ and $a = 2m$, we get $H = 8/4 = 2$ units.

5. The current element of the solenoid of turns 100, length 2m and current 0.5A is given by,

a) 100 dx

b) 200 dx

c) 25 dx

d) 50 dx

View Answer

Answer: c

Explanation: The current element of the solenoid is given by NI dx/L. Put N = 100, I = 0.5 and L = 2 to get, I dx = 100 x 0.5 x dx/2 = 25 dx.

7. Find the magnetic flux density when a point from a finite current length element of current 0.5A and radius 100nm.

a) 0

b) 0.5

c) 1

d) 2

View Answer

Answer: c

Explanation: The magnetic flux density is $B = \mu H$, where H is given by $I/2\pi r$. Put $\mu = 4\pi \times 10^{-7}$, $I = 0.5$ and $r = 10^{-7}$, we get $B = 4\pi \times 10^{-7} \times 0.5/2\pi \times 10^{-7} = 1$ unit.

9. The magnetic field intensity will be zero inside a conductor. State true/false.

a) True

b) False

View Answer

Answer: b

Explanation: Electric field will be zero inside a conductor and magnetic field will be zero outside the conductor. In other words, the conductor boundary, E will be maximum and H will be minimum.

10. Find the magnetic field when a circular conductor of very high radius is subjected to a current of 12A and the point P is at the centre of the conductor.

a) 1

b) ∞

c) 0

d) -∞

View Answer

Answer: c

Explanation: The magnetic field of a circular conductor with point on the centre is given by I/2a. If the radius is assumed to be infinite, then H = 12/2(∞) = 0.

25. Hysteresis loss least depends on

A. Volume of material

B. Frequency

C. Steinmetz's coefficient of material

D. Ambient temperature

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option D

17. Silicon steel is used in electrical machines because it has

A. Low coercivity

B. Low retentivity

C. Low hysteresis loss

D. High coercivity

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

18. If the area of hysteresis loop of a material is large, the hysteresis loss in this material will be

A. Zero

B. Small

C. Large

D. None of the above

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

19. The unit of retentivity is

A. Weber

B. Weber/sq. m

C. Ampere turn/meter

D. Ampere turns

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option B

20. An air gap is usually inserted in magnetic circuits to

A. Increase m.m.f.

B. Increase the flux

C. Prevent saturation

D. None of the above

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

16. When both the inductance and resistance of a coil are doubled the value of

A. Time constant remains unchanged

B. Initial rate of rise of current is doubled

C. Final steady current is doubled

D. Time constant is halved

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option A

15. Reciprocal of reluctance is

A. Reluctivity

B. Permeance

C. Permeability

D. Susceptibility

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option B

14. A material for good magnetic memory should have

A. Low hysteresis loss

B. High permeability

C. Low retentivity

D. High retentivity

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option D

13. Permanent magnets are normally made of

A. Alnico alloys

B. Aluminium

C. Cast iron

D. Wrought iron

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option A

9. In a magnetic material hysteresis loss takes place primarily due to

A. Rapid reversals of its magnetization

B. Flux density lagging behind magnetizing force

C. Molecular friction

D. It high retentivity

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option D

10. Permeability in a magnetic circuit corresponds to_____ in an electric circuit.

A. Resistance

B. Resistivity

C. Conductivity

D. Conductance

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

11. A ferrite core has less eddy current loss than an iron core because

A. Ferrites have high resistance

B. Ferrites are magnetic

C. Ferrites have low permeability

D. Ferrites have high hysteresis

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option D

12. Conductance is analogous to

A. Permeance

B. Reluctance

C. Flux

D. Inductance

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option A

8. **Relative permeability of vacuum is**

A. 1

B. 1 H/m

C. 1/4JI

D. 4n × 10' H/m

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option A

6. **Those magnetic materials are best suited for making armature and transformer cores which have _____permeability and _____hysteresis loss.**

A. High, high

B. Low, high

C. High, low

D. Low, low

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option C

5. **Those materials are well suited for making permanent magnets which have _____ retentivity and _____ coercivity.**

A. Low, high

B. High, high

C. High, low

D. Low, low

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option B

4. Laminated cores, in electrical machines, are used to reduce

A. Copper loss

B. Eddy current loss

C. Hysteresis loss

D. All of the above

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option B

View Answer

Answer: a

Explanation: Reluctance = $l/(\mu*A) = l/(\mu_r\mu_0*A)$ Substituting the values, we get Reluctance S=1.68*106 A/Wb.

F=ϕS Substituting the given values, we get F = 1344At.

I=F/N Substituting the values from the question, we get I=6.7A.

8. Can we apply Kirchhoff's law to magnetic circuits?

a) Yes

b) No

c) Depends on the circuit

d) Insufficient information provided

View Answer

Answer: a

Explanation: Magnetic circuits have an equivalent to the potential difference of electric circuits. This is the magnetic potential difference which allows us to apply Kirchhoff's laws to magnetic circuit analysis.

9. What is MMF?

a) Magnetic Machine Force

b) Magnetomotive Force

c) Magnetic Motion Force

1. **While comparing magnetic and electric circuits, the flux of magnetic circuit is compared with which parameter of electrical circuit?**

A. E.M.F.

B. Current

C. Current density

D. Conductivity

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option B

2. **Point out the wrong statement. Magnetic leakage is undesirable in electric machines because it**

A. Lowers their power efficiency

B. Increases their cost of manufacture

C. Leads to their increased weight

D. Produces fringing

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option A

3. The unit of magnetic flux is

A. Henry

B. Weber

C. Ampere-turn/weber

D. Ampere/metre

Answer & Solution | Discuss in Board | Save for Later

Answer & Solution

Answer: Option B