Assignment 1

Due on 2019-04-16 22:00 IST

Unit 3 - Week 1

Course code: 213111
Module: 2131111
Week 1:

1. A copper wire is wound into a toroid of mean radius 20 cm. Describe the magnetic field in this toroid.

2. The magnetic flux through a coil is 10 Wb. If the area of the coil is 2 m², what is the magnetic field intensity?

3. A solenoid has a length of 40 cm and a current of 2 A. What is the magnetic field at the center of the solenoid?

4. A coil with 100 turns and a current of 5 A has a magnetic field of 0.1 T at the center. Calculate the magnetic flux through the coil.

5. Which of the following is not a magnetic material?
   a) Iron
   b) Nickel
   c) Tungsten
   d) Cobalt

6. Which of the following properties are not characteristics of a magnetic material?
   a) Magnetic moment
   b) Magnetic permeability
   c) Ferromagnetic
   d) Magnetostrictive

7. Which of the following materials has the highest magnetic permeability?
   a) Nickel
   b) Iron
   c) Copper
   d) Aluminum

8. Which of the following statements is true for a magnetic field?
   a) It is always uniform
   b) It is always perpendicular to the surface of the coil
   c) It is always directed outward
   d) It is always directed inward

9. Which of the following inductance formulas is correct for an air-core coil?
   a) \( L = \frac{N^2}{A} \)
   b) \( L = \frac{N^2}{A} \)
   c) \( L = \frac{N^2}{A} \)
   d) \( L = \frac{N^2}{A} \)

10. Which of the following is not a superconducting material?
    a) Copper
    b) Silver
    c) Aluminum
    d) Lead

11. Which of the following is not a magnetic property?
    a) Magnetic moment
    b) Magnetic susceptibility
    c) Magnetic field intensity
    d) Magnetic permeability

12. Which of the following materials does not have any magnetic properties?
    a) Copper
    b) Iron
    c) Plastic
    d) Carbon

13. Which one of the following statements is correct about magnetic field?
    a) It is always uniform
    b) It is always perpendicular to the surface of the coil
    c) It is always directed outward
    d) It is always directed inward

14. Which of the following statements is not true about magnetic flux?
    a) It is always perpendicular to the surface of the coil
    b) It is always directed outward
    c) It is always directed inward
    d) It is always uniform

15. Which of the following is not a magnetic material?
    a) Iron
    b) Nickel
    c) Tungsten
    d) Cobalt

The definition of the magnetic field is:

- A vector field that describes the magnetic forces acting on a charged particle in motion through a magnetic field.
- The magnetic field is responsible for the force acting on a current-carrying conductor in a magnetic field.
- The magnetic field is produced by electric current and can be measured using magnetic field sensors.
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