

DECEMBER 2021

**EBS 408SW  
ELECTRICITY AND MAGNETISM (THEORY)  
30 MINUTES**

<b>Candidate's Index Number:</b>
<b>Signature:</b>

**UNIVERSITY OF CAPE COAST  
COLLEGE OF EDUCATION STUDIES  
SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH  
INSTITUTE OF EDUCATION**

**COLLEGES OF EDUCATION  
ONE-YEAR THREE-SEMESTER BACHELOR OF EDUCATION  
COHORT II, LEVEL 300, SEMESTER TWO QUIZ – DECEMBER 2021**

**DECEMBER 29, 2021**

**ELECTRICITY AND MAGNETISM  
(THEORY)**

**8:00 AM – 8:30 AM**

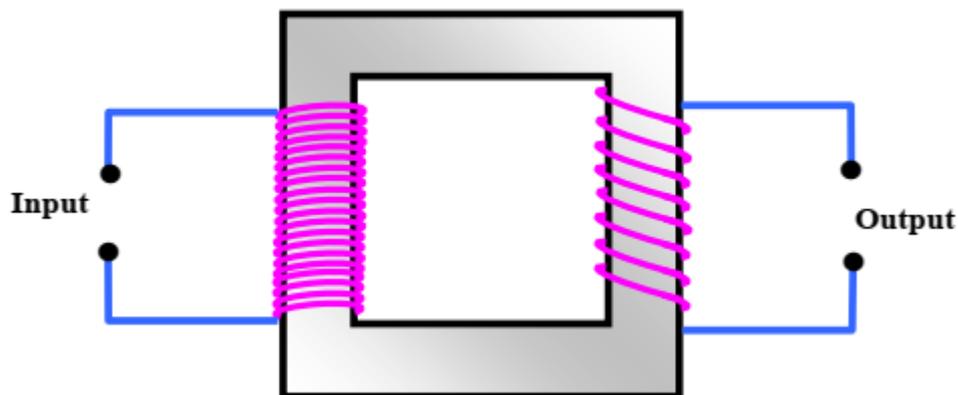
**Answer ALL the questions.**

**For items 1 to 20, each stem is followed by four options lettered A to D. Read each item carefully and write the letter of the correct or best option.**

1. The direction of the induced electromotive force is such that the induced current creates a magnetic field that opposes the change in flux. .... law.  
A. Ampere's  
B. Eddy current  
C. Faraday's  
**D. Lenz's**
2. Which of these is not true about a magnetic field due to current in a long straight Conductor?  
**A. A circular electric field is set up in the region surrounding a current carrying wire**  
B. The direction of magnetic field is determined by right hand rule as shown in the figure.  
C. The magnetic field lasts only as long as the current is flowing through the wire.  
D. The magnetic field will be anticlockwise when current flows from bottom to top and vice versa.
3. Magnetic force according to extension of right-hand rule is from ..... region of field.  
A. left region of field to a right  
B. right region of field to a left  
**C. strong region of field to a weaker**  
D. weak region of field to a stronger

4. Which of these is defined as the force acting on one-meter length of conductor placed at right angle to the magnetic field carrying a current of 1 A? Magnetic .....
  - A. coil.
  - B. flux.
  - C. induction.**
  - D. intensity.
  
5. The magnetic flux passing perpendicularly through a surface per unit area is **known** as the magnetic .....
  - A. coil
  - B. flux**
  - C. induction
  - D. intensity
  
6. Electric force on the charged particle is parallel to the electric field whereas the magnetic force is always ..... field.
  - A. adjacent to the magnetic
  - B. parallel and perpendicular to the magnetic
  - C. parallel to the magnetic
  - D. perpendicular to the magnetic**
  
7. Magnetic field due to a straight conductor is proportional to the magnetic field produced and inversely proportional to the distance from the axis. This represent which of these laws? ..... Law.
  - A. Ampere's**
  - B. Eddy current
  - C. Faraday's
  - D. Lenz's
  
8. A long, tightly wound, cylindrical coil of wire is called .....
  - A. circuit.
  - B. coil.
  - C. solenoid.**
  - D. toroid.
  
9. What name is given to a material's measure of its conductivity for magnetic field lines? Magnetic .....
  - A. flux.
  - B. permeability.**
  - C. permeability of free space.
  - D. relative permeability.

10. Which of the following laws states that *the average emf induced in a conductor coil of  $N$  loops is equal to the negative of the rate at which the magnetic flux through the coil is changing with time?* ..... Law.
- Ampere's
  - Coulomb's
  - Faraday's**
  - Lorentz's
11. The property of a coil (or circuit) by virtue of which it opposes any change in the amount of current flowing through it is called ..... inductance of the coil.
- magnetic
  - mutual
  - permeable
  - self-**
12. What name is given to an electrical device used either to increase or decrease alternating emf with corresponding increase or decrease in current?
- AC motor.
  - DC motor.
  - Generator .
  - Transformer.**
13. The diagram below represents which type of an electric transformer. ....transformer.



- Coil down
  - Coil up
  - Step down**
  - Step up
14. An air core solenoid has 1000 turns and is one-meter long. Its cross-sectional area is  $10 \text{ cm}^2$ . Its self-inductance is ..... Henry.
- $12.566 \times 10^{-2}$
  - $12.566 \times 10^{-3}$
  - $12.566 \times 10^{-4}$**
  - $12.566 \times 10^{-5}$

15. The primary winding of transformer has 500 turns whereas its secondary has 5000 turns. The primary is connected to an AC supply of 20 V, 50 Hz. The secondary winding output will be.....
- A. 2 V, 5 Hz.
  - B. 2 V, 50 Hz.
  - C. 200 V, 50 Hz.**
  - D. 200 V, 500 Hz.
16. In AC generator, if both number of turns and angular velocity of coil are doubled then induced emf is .....
- A. doubled.
  - B. halved.
  - C. increased by four times.**
  - D. unchanged.
17. If current in a solenoid is doubled then energy stored in its magnetic field is .....
- A. decreases by four times.**
  - B. doubled.
  - C. halved.
  - D. increased by four times.
18. If a current of 2 A is passing through a solenoid of inductance 2 H, then energy stores in it is .....
- A. 2J
  - B. 3J
  - C. 4J**
  - D. 8J
19. If the current passing through a coil of inductance 5 H decreases at the rate of 2 A/s, the induced emf in the coil is .....
- A. 2.5 V
  - B. 4.5 V
  - C. 6.5 V
  - D. 10 V**
20. What is the energy stored by an inductor of inductance 8 H when current through it rises from zero to maximum value of 3A?
- A. 3J
  - B. 6 J
  - C. 12J
  - D. 36J**