

2024 SHS2 END OF SEMESTER EXAMS – APPLIED ELECTRICITY 2

APPLIED ELECTRICITY

PAPER 2

SECTION B

ESSAY (1 HOUR)

[50 marks]

Answer **five** questions only from this section.

Write your answer in **ink** in your answer booklet.

All questions carry equal marks

1. I. A coil of 100turns, 10cm in length carries a current of 0.4A. if the magnetic flux density of the core is 0.14T, calculate the

a. Magnetomotive force

----- [1 mark]

b. Magnetizing force

----- [1 mark]

c. Permeability of the magnetic material

----- [1 mark]

II. Sketch a typical hysteresis loop for an iron cored coil including the magnetization curve and mark the following on the loop

- Coercive force.
- Residual magnetism.
- Saturation zone

----- [7 marks]

2. a. Define the potential gradient of an electric field.

-----[4 marks]

b. Define capacitance and list three materials that are used in capacitors for each of the following

- i. dielectric
- ii. Plates

| Dielectric materials | Plate materials |
|----------------------|-----------------|
| | |
| | |
| | |

[6 marks]

3. Draw and explain the circuit of a (i) charging capacitor (ii) Discharging capacitor

-----[10 marks]

4. a. State the laws of electromagnetic induction

-----[4 marks]

b. sketch the magnetic field pattern of a current carrying conductor wound round a soft iron core.

-----[4 mark]

c. State the rule for the determination of the polarity of the field.

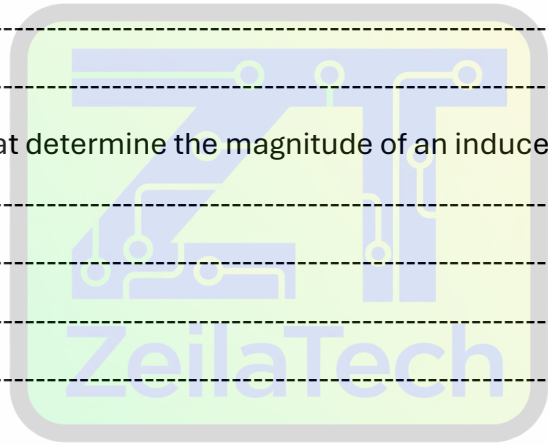
-----[2 marks]

5. a. Explain the term mutual and self-inductance

-----[4 marks]

b. What are the factors that determine the magnitude of an induced e.m.f?

-----[6 marks]



6. a. State

i. Two factors which affect the induced e.m.f in a conductor

-----[2 marks]

ii. Three ways of inducing e.m.f. in a conductor

-----[3 marks]

b. State two effects of self-inductance of a coil forming part of a circuit

-----[2 marks]

d. Tabulate three differences between permanent magnets and electromagnets

| Permanent Magnets | Electromagnets |
|-------------------|----------------|
| | |
| | |
| | |

[3 marks]

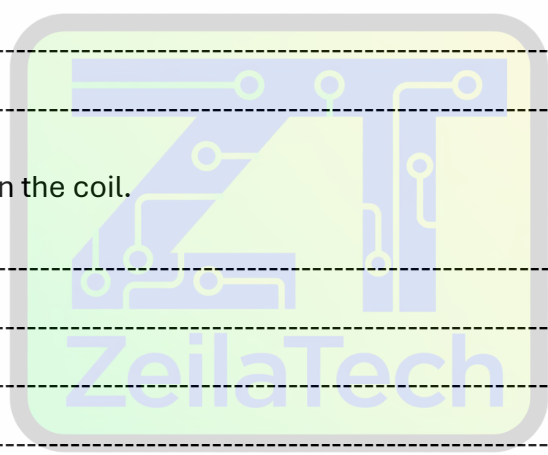
7. The current in a coil changes from 5A to 1A in 0.4 seconds. If the induced e.m.f is 40V, calculate;

i. the self-inductance of the coil

----- [5 marks]

ii. The energy stored in the coil.

----- [5 marks]



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