# UNIVERSITI KUALA LUMPUR <br> Malaysia France Institute 

## FINAL EXAMINATION

## JANUARY 2014 SESSION

| SUBJECT CODE | $:$ FED 10202 |
| :--- | :--- |
| SUBJECT TITLE | $:$ ELECTRICAL PRINCIPLES |
| LEVEL | $:$ DIPLOMA |
| TIME / DURATION | $:$ |

## INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. Please write your answers on the answer booklet provided.
4. Answers should be written in blue or black ink except for sketching, graphic and illustration.
5. This question paper consists of TWO (2) sections. Section A and B. Answer all questions in Section A. For Section B, answer one (1) question only.
6. Answer all questions in English.

## SECTION A (Total:60 marks)

## INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

## Question 1

For the circuit shown in Figure 1, the current at switch position A is 20.675 mA .
Determine:
(a) The main characteristics of series circuits in terms of resistances, currents and voltage drop across resistors.
(b) The resistance value for R5.
(c) The current for switch position B,C and D.
(d) The minimum current rating for the fuse in this circuit.


Figure 1

## Question 2

For the circuit shown in Figure 2, determine:
(a) The total resistance for the circuit.
(b) The current through each resistor.
(c) The voltage drop across each resistor.
(d) The power dissipated on each resistor.


Figure 2

## Question 3

(a) Describe the basic construction of a capacitor.
(4 marks)
(b) Describe the charging and discharging process of a capacitor.
(6 marks)
(c) How long will it take for the initially uncharged capacitor in Figure 3 to charge to 6 V ?
(6 marks)
(d) Calculate the fully charged capacitor voltage 1 ms after the switch is closed for discharge?


Figure 3

## SECTION B (Total: 40 marks)

INSTRUCTION: Answer ONE (1) question only
Please use the answer booklet provided.

## Question 4

For the circuit shown in Figure 4, determine:
(a) the time constant, T .
(10 marks)
(b) current at time $\tau, 2 T, 3 \tau, 4 \tau$ and $5 \tau$ measured from the switch is closed.
(20 marks)
(c) the physical properties that affect inductance.


Figure 4

## Question 5

## Refer to Figure 5.

(a) Determine the voltages $\mathrm{V}_{\mathrm{AB}}, \mathrm{V}_{\mathrm{CD}}, \mathrm{V}_{(\mathrm{CT}) \mathrm{C}}$ and $\mathrm{V}_{\mathrm{EF}}$.
(20 marks)
(b) Describe center-tapped, autotransformer and multiple winding transformer.
(20 marks)


Figure 5

