UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
JANUARY 2016 SEMESTER

COURSE CODE	:	LED 10202
COURSE NAME	:	INTRODUCTION TO ELECTRONIC CIRCUIT
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	DIPLOMA OF ELECTRICAL AND ELECTRONIC (MARINE)
DATE	:	24 MAY 2016
TIME	:	2.00 PM – 4.00 PM
DURATION	:	2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please CAREFULLY read the instructions given in the question paper.

2. This question paper has information printed on both sides of the paper.

3. This question paper consists of TWO (2) sections; Section A and Section B.

4. Answer ALL questions in Section A. For Section B, answer TWO (2) questions only.

5. Please write your answers on the answer booklet provided.

6. Answer all questions in English language ONLY.

THERE ARE 7 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

PART A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1

a. As electrical engineers, we deal with measurable quantities. Our measurement must be communicated in a standard language that virtually all professionals can understand such an International System of Units (SI). List out three (3) of the derived unit commonly used in electrical including quantities, unit and symbols.

[6 marks]

b. Resistor is a device which provides resistance in an electrical circuit. The resistance value can be determined by a color code. Determine the nominal resistance and the possible range of actual resistance values corresponding to each of the following color codes:

    i.   Brown , Grey, Black ,Gold   [2 marks]

    ii.   Orange , Blue, Gold, Gold   [2 marks]

    iii. Green , Violet , Orange , Silver   [2 marks)

    iv.   Blue , Black , red , Gold   [2 marks]

c. Electric circuit is interconnection between components or electrical devices for the purpose of communicating or transferring energy from one point to another. State definition and include the equation of:
    i.   Ohm's law
    ii.   Kirchhoff current law

[6 marks]

Question 2

a. Series and parallel electrical circuits are two basic ways of wiring components. The names describe the method of attaching components, which is one after the other or next to each other. A series circuit is one that has a single path for current flow through all of its elements. A parallel circuit is one that requires more than one path for current flow in order to reach all of the circuit elements. Analyze **Figure 1**, and fill the answers in the table below (the answers must together with the calculation):

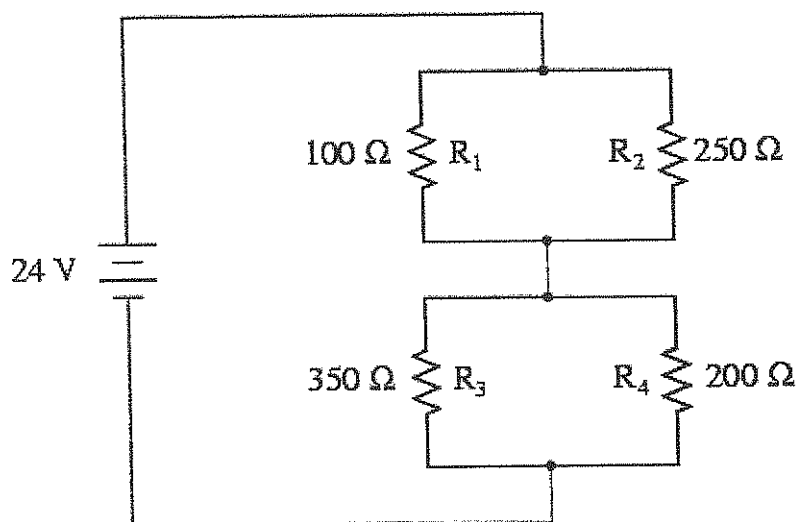|	R1	R2	R3	R4	Total		Marks
E						Volts	5 marks
I						Amps	5 marks
R						Ohms	5 marks
Total Power						Watt	5 marks

[20 marks]

Figure 1

Question 3

a.   An accidental short circuit to a 240 V supply is caused by the connection of a component of 5 mΩ across the supply terminal. Calculate :

    i.   the short circuit current.

[3 marks]

    ii.   the power dissipated.

[3 marks]

    iii. the voltage supply if current are 8.5mA with the resistor is brown, green ,silver and gold.

[4 marks]

b.   A washing machine draws 10 A of current from a 120V source. Calculate the power expended by this machine.

[5 marks]

c.   The washing machine runs for 2 hours each day, define the cost (owner need to pay for Energy provider/ TNB) to run the machine for a 30 days, if the rate for electricity is 8 cents per-kilowatt-hour. (Given $E = Pt$)

[5 marks]

PART B (Total: 40 marks)

INSTRUCTION: Answer only TWO (2) questions.
Please use the answer booklet provided.

Question 4

a. Define magnetic flux, magnetic field and electromagnetism.

[6 marks]

b. State four (3) characteristics of line magnetic flux.

[6 marks]

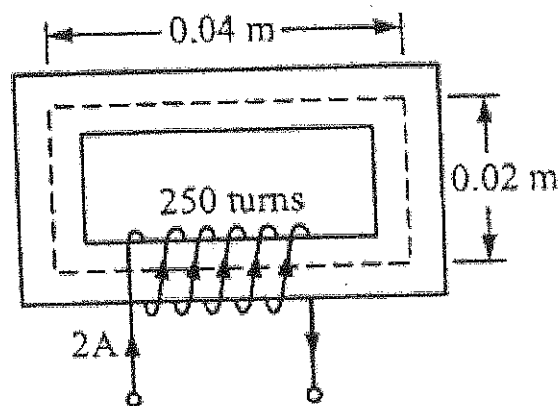c. Refer to required data in Figure 2, calculate the field intensity in the magnetic circuit

Figure 2

[8 marks]

Question 5

a. Define the 'step up transformer' and 'step-down transformer'.

[6 marks]

b. Sketch and label the simple diagrams of 'step up' transformer.

[4 marks]

c. Define the three materials are commonly used as the core of transformer.

[3 marks]

d. A voltage transformer has 1500 turns of wire on its primary coil and 500 turns of wire for its secondary coil. Calculate the turns ratio (TR) of the transformer.

[3 marks]

e. If 240 volts rms is applied to the primary winding of the same transformer above, examine the resulting secondary no load voltage.

[4 marks]

Question 6

a. An RLC circuit is an electrical circuit consisting of a resistor, an inductor, and a capacitor, connected in series or in parallel. **Figures 3** shows the R-L-C circuits and determines:
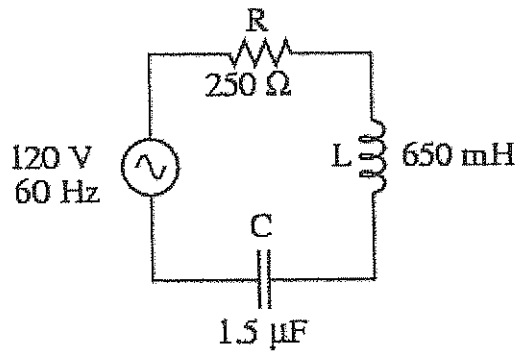

Figure 3

i. Reactance values for capacitor and inductor [6 marks]

ii. Total Impedance in the circuit [2 marks]

iii. Total current flows in the circuit [2 marks]

b. Three (3) capacitors have capacitances of $15\,\mu F, 20\,\mu F$ and $25\,\mu F$ respectively. Calculate the total capacitances value and the total charge value when they are connected at 110V:

i. In parallel circuit [5 marks]

ii. In series circuit [5 marks]

END OF QUESTION