Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024

COURSE NAME	:	FUNDAMENTAL OF ELECTRICAL TECHNOLOGY
COURSE CODE	:	BBP10703
PROGRAMME CODE	:	BBG
EXAMINATION DATE	:	JULY 2024
DURATION	:	3 HOURS
INSTRUCTIONS	:	1. ANSWER **ALL** QUESTIONS. 2. THIS FINAL EXAMINATION IS CONDUCTED VIA. ☐ OPEN BOOK ☒ CLOSED BOOK 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 (a) Discuss the meaning of an electric current.

(3 marks)

(b) Explain how electricity is produced in a conductor in terms of potential difference and charges.

(6 marks)

(c) List down **EIGHT** (**8**) sources of electric energy.

(8 marks)

(d) Discuss the factors that affecting the resistance in any conductor include their symbols and measurement units.

(8 marks)

Q2 (a) Describe in brief the conductor, insulator and semiconductor.

(6 marks)

(b) List **SIX** (**6**) examples of materials for conductor and insulator.

(6 marks)

(c) In some motor vehicles, the length of the motor copper cable (motor stator) is 1.1m. Cable resistance is 0.002Ω. Calculate the value of the diameter of the cable if the copper resistance is $1.72 \times 10^{-8}\Omega m$.

(8 marks)

(d) Interprete the value of the resistance according to the colors below. Obtain your answer using the resistor color code in **Figure Q2(d)**.
Yellow – Band 1
Violet – Band 2
Black – Band 3
Orange – Band 4
Gold – Band 5

(5 marks)

Q3 (a) Define the resistor.
(3 marks)

(b) Calculate the total resistance (R_T) for the circuit in **Figure Q3(b)**.
(6 marks)

(c) Explain the status of the multimeter in the following conditions:
(i) The resistance is open.
(ii) The resistance is high value.
(4 marks)

(d) Calculate the total resistance (R_t) of the series-parallel circuit in the **Figure Q3(d)**.
(8 marks)

(e) State the Kirchhoff's Current Law (KCL) and the Kirchhoff's Voltage Law (KVL)
(4 marks)

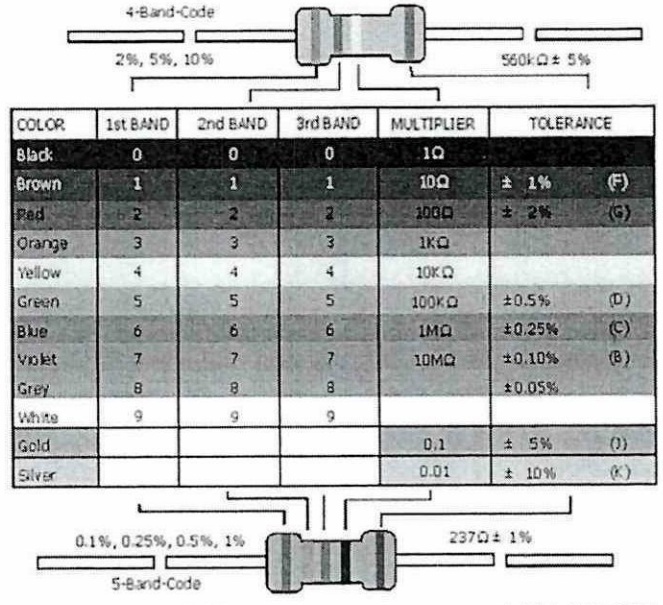
Q4 (a) List the **Four** (**4**) types of permanent inductance.
(4 marks

(b) Calculate the total inductance (L_{AB}) for the circuits in the **Figure Q4(b)**.
(8 marks)

(c) Based on the **Figure Q4(c)**, (Please attach the Figure Q4(c))
Identify the formula to calculate the value of the capacitor.
Indicate those factors from the formula (i).
Label the elements using the formula (i).
(6 marks)

(d) Calculate the total capacitance (C_{AB}) for the circuits in the **Figure Q4(d)**.
(7 marks)

-END OF QUESTIONS-



COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER	TOLERANCE	
Black	0	0	0	1Ω		
Brown	1	1	1	10Ω	± 1%	(F)
Red	2	2	2	100Ω	± 2%	(G)
Orange	3	3	3	1KΩ		
Yellow	4	4	4	10KΩ		
Green	5	5	5	100KΩ	±0.5%	(D)
Blue	6	6	6	1MΩ	±0.25%	(C)
Violet	7	7	7	10MΩ	±0.10%	(B)
Grey	8	8	8		±0.05%	
White	9	9	9			
Gold				0.1	± 5%	(J)
Silver				0.01	± 10%	(K)

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Figure Q2(d)

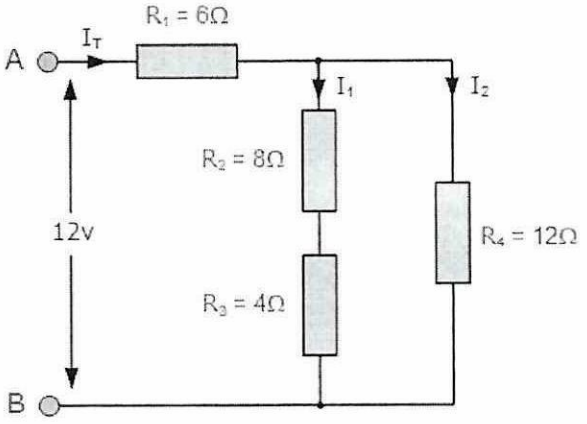

Figure Q3(b)

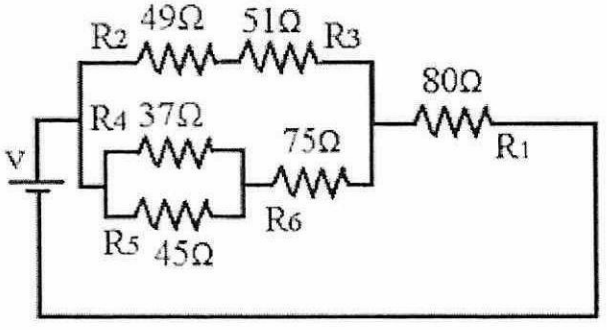

Figure Q3(d)

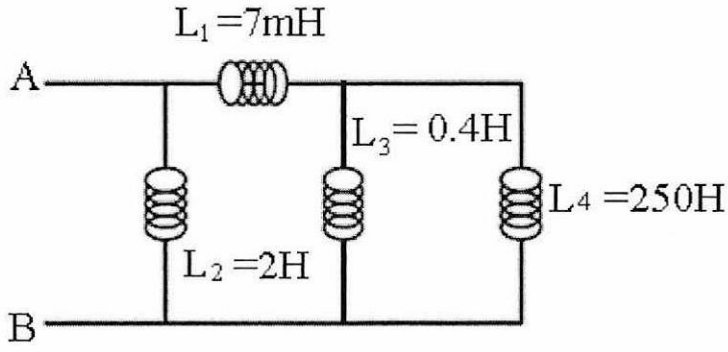

Figure Q4(b)

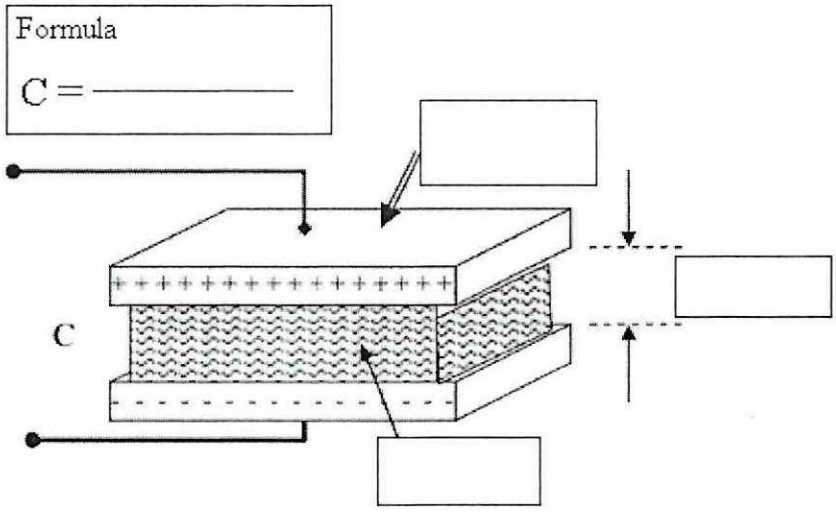

Figure Q4(c)

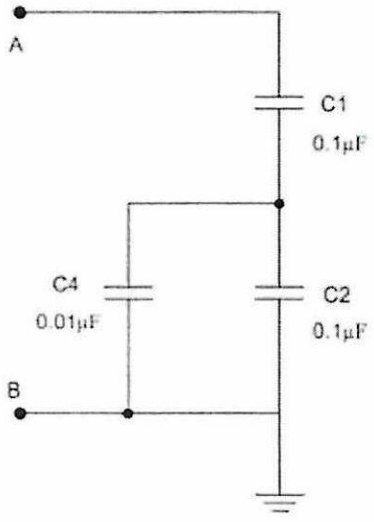

Figure Q4(d)