

**UNIVERSITY COLLEGE TATI (UC TATI)****FINAL EXAMINATION QUESTION BOOKLET**

COURSE CODE	: BMT 1033
COURSE	: ELECTRICAL TECHNOLOGY
SEMESTER/SESSION	: 1-2022/2023
DURATION	: 3 HOURS

Instructions:

1. This booklet contains **4** questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 7 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

- a) Define the meaning of an ideal current source. (2 marks)
- b) Answer the following questions:
- Differentiate **two (2)** types of current by definition. (4 marks)
 - Illustrate the types of current to support your answer in b) (i). (2 marks)
- c) Identify the placement of an ammeter and a voltmeter to measure the current and the voltage across resistor, R_2 in Figure 1. (2 marks)

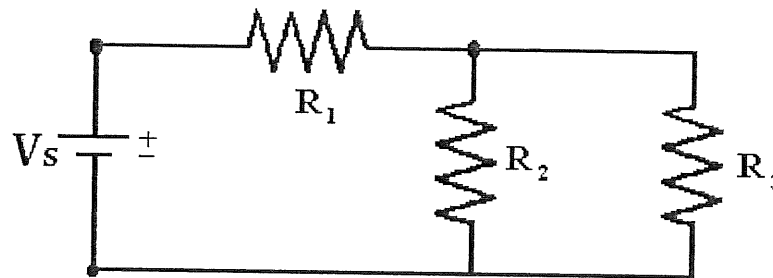


Figure 1

- d) Describe briefly the charging process in a capacitor including the diagram. (11 marks)

- e) Calculate the total inductance, L_T of the following inductive circuit in Figure 2.

(9 marks)

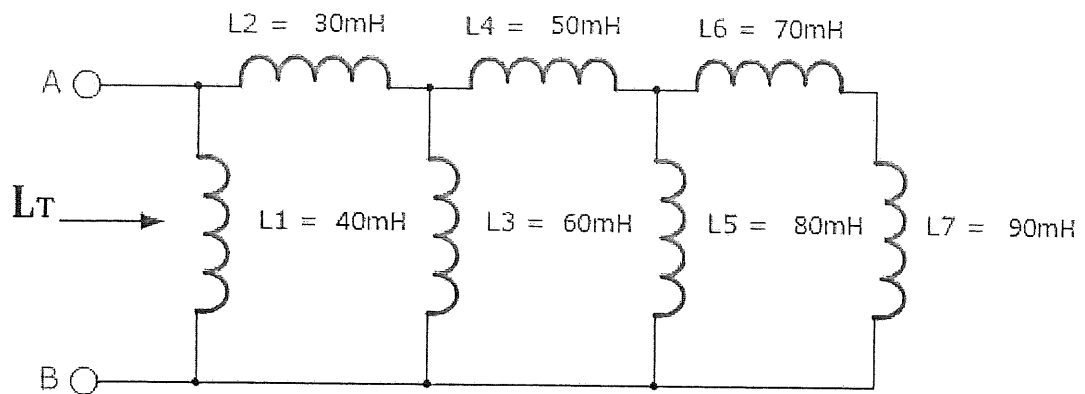


Figure 2

QUESTION 3

- a) Define the following terms:
- i. Electric power transmission. (2 marks)
 - ii. Electric power distribution (2 marks)
- b) Differentiate **five (5)** comparisons of single phase and three phase system. (10 marks)
- c) A Y-connected supplies is connect to Y-connected loads as shown in Figure 6. Calculate voltage and current in the given three phase system if the impedance per phase of the load is $6 + j8\Omega$.
- i. Voltage, V_{bn} (1 mark)
 - ii. Voltage, V_{cn} (1 mark)
 - iii. Current, I_a (2 marks)
 - iv. Current, I_b (1 mark)
 - v. Current, I_c (1 mark)

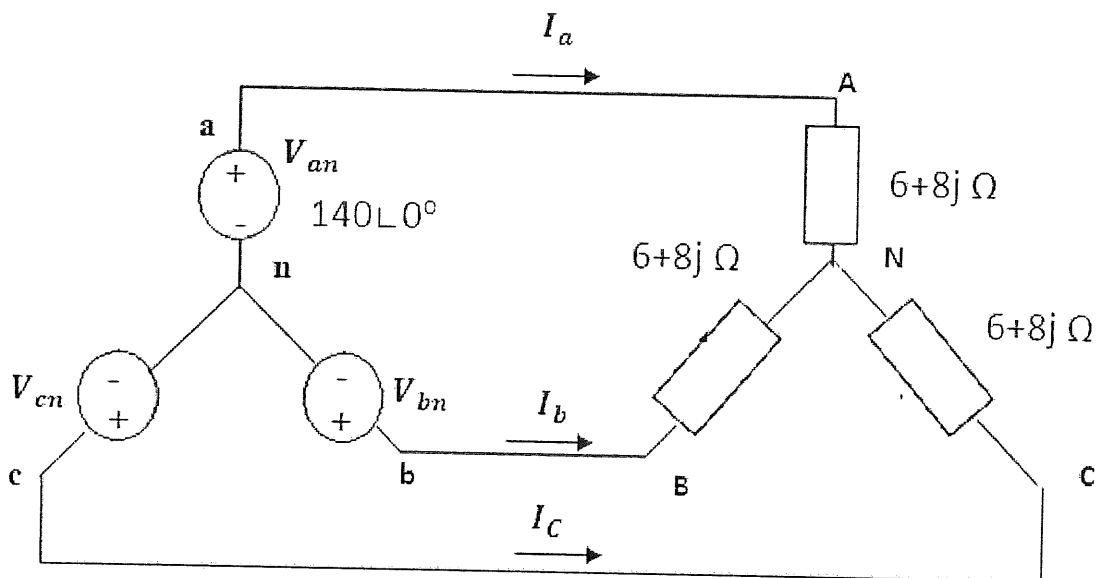


Figure 6

QUESTION 4

- a) Describe characteristics a single-phase voltage transformer. (9 marks)
- b) A single phase transformer has 500 turns on the primary winding and 60 turns on the secondary winding. The maximum value of the magnetic flux density is 1.4T when 1100 volts, 50Hz is applied to the transformer primary winding. Calculate :
- i. The transformer ratio, a . (2 marks)
 - ii. The maximum flux in the core, Φ_{max} . (3 marks)
 - iii. The cross-sectional area of the core, A . (3 marks)
 - iv. The secondary induced emf, V_S (3 marks)

-----End of question-----

