



SET B

**UNIVERSITI KUALA LUMPUR
MALAYSIA FRANCE INSTITUTE**

**FINAL EXAMINATION
JULY 2010 SESSION**

SUBJECT CODE : FED 10202
SUBJECT TITLE : ELECTRICAL PRINCIPLES
LEVEL : DIPLOMA
TIME / DURATION : 9.00am – 11.30am
(2.5 HOURS)
DATE : 10 NOVEMBER 2010

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. Answer 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 question in Section A. For Section B answer only Two (2) questions only.
 6. Answer all questions in English.
-

THERE ARE 5 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

- (a) List 3 factors that determine the resistance value of a resistor.

(3 marks)

- (b) Convert the following SI units

- (i) .95,629 kilohms to Megaohm
- (ii) 0.007 MW to kilowatts
- (iii) 1.6 m^2 to square centimeter
- (iv) 52,589 millivolts to kilovolts

(10 marks)

- (c) The circuit diagram system is shown in Figure 1. Voltage across R_1 is 6 V and voltage across R_4 and R_5 is 30 V. Determine the value of battery E and resistance R_4 .

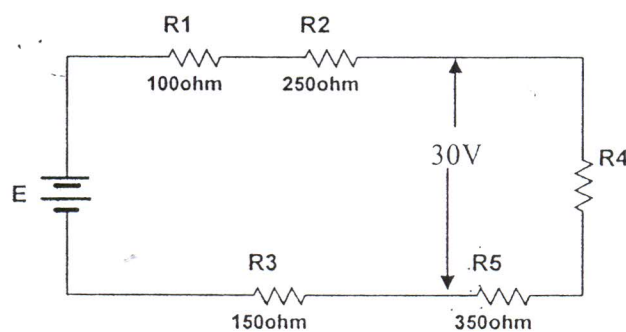


Figure 1

(7 marks)

Question 2

The circuit diagram for series parallel circuit is shown in Figure 2:

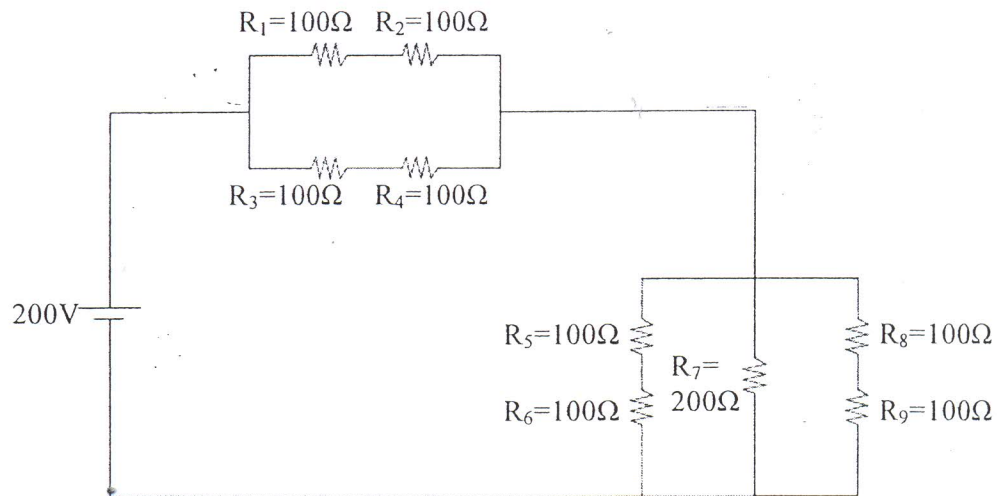


Figure 2

- (a) From Figure 2, find the current through each resistor

(16 marks)

- (b) The voltage drop across resistor R_4 and power dissipated at R_7

(4 marks)

Question 3

- (a) Figure 3 is the sinusoidal waveform for an instantaneous voltage, determine
- the period of the waveform
 - the frequency
 - the angular velocity
 - value of $v(t)$ at $t = 0$ msec, $t = 0.025$ msec and $t = 0.125$ msec
 - Write the equation for the waveform

(10 marks)

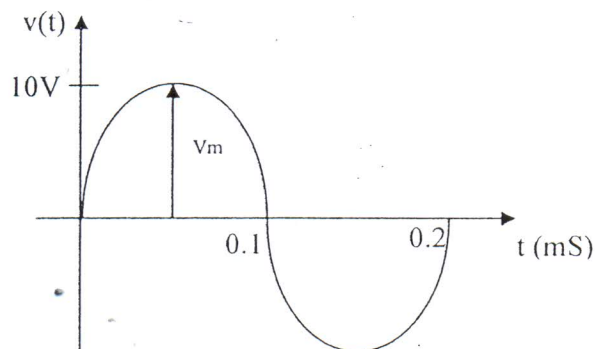


Figure 3

- (b) For the circuit shown in Figure 4, determine:

- the total impedance in polar form.
- I_T , I_1 , and I_3

(12 marks)

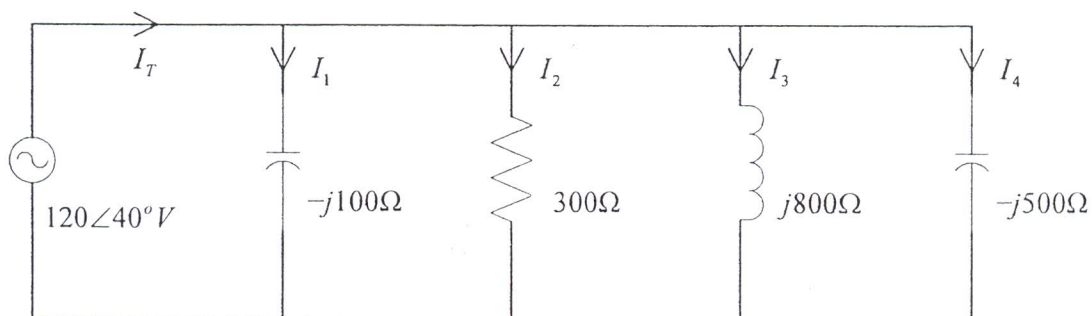


Figure 4

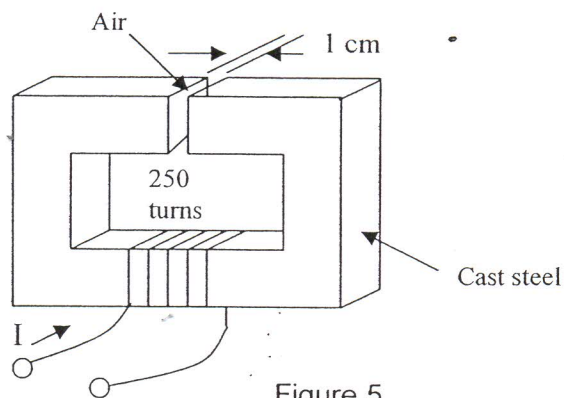
PART B (Total: 40 marks)**INSTRUCTION: Answer Two (2) questions only****Please use the answer booklet provided.****Question 4**

Determine the current that must be supplied to the winding in Figure 5 in order to produce a flux of 6×10^{-3} Wb throughout the core. The mean length of the cast steel is 1.2 m and its cross section has dimensions 10 cm x 5 cm. Neglect fringing in the air gap.

(20 marks)

The characteristics of magnetic circuit for cast steel are as given below :

B (Wb / m ²)	0.4	0.67	0.8	1.0	1.2
H (AT / m)	120	200	320	520	1000

**Question 5**

A three phase 415 V, 50 Hz, a.c supply is feeding a three phase star connected loads, which is $Z_m = 35 - jX_C$, $Z_{yn} = 35 + jX_L$ and $Z_{bn} = 35\Omega$ as shown in Figure 6. Determine:

- the inductance, X_L and capacitance, X_C .
- line current, I_1 , I_2 and I_3 .
- neutral current, I_n

(20 marks)

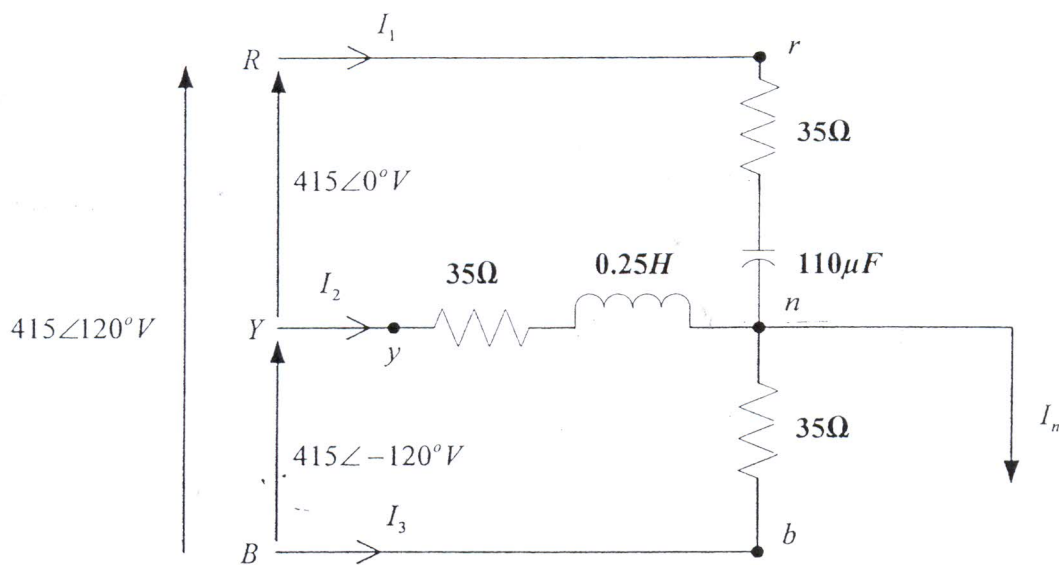


Figure 6

Question 6

From Figure 7, the transformer ratio is 40 : 30. Assuming the transformer is ideal, determine the magnitude of ;

- (a) secondary voltage (e_s)
- (b) primary voltage (e_p)
- (c) primary current (i_p)
- (d) average input power (P_{in})
- (e) average output power (P_o)

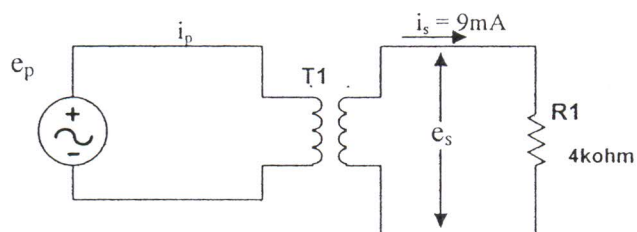


Figure 7

END OF QUESTION PAPER