



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
JULY 2010 SESSION**

SUBJECT CODE : FEB 10302
SUBJECT TITLE : ELECTRICAL TECHNOLOGY
LEVEL : BACHELOR
TIME / DURATION : 9.00am – 11.00am
(2 HOURS)
DATE : 20 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 **FIVE (5)** questions. Answer all questions.
6. Answer all questions in English.

THERE ARE 2 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

A motor load consists of 80Ω resistor series with a 100mH inductor are connected to 150V and 200Hz . Determine

- (a) the current in the circuit
- (b) the circuit phase angle
- (c) the power factor of the circuit
- (d) the power absorbed by the circuit
- (d) the reactive power
- (e) the value of the static capacitor connected in parallel with the loads to improve the overall power factor to 0.975 lagging.

(20 marks)

Question 2

A series RLC circuit with $R=25\Omega$ and $L=0.6\text{H}$ has a leading phase angle of 60° at a frequency of 40Hz .

- (a) Draw the impedance triangle and solve for the net reactance X .
- (b) Find the inductive reactance X_L and then capacitive reactance X_C .
- (c) Calculate the value of the capacitor C and the frequency at which the circuit will be resonance.
- (d) Determine the value of inductive reactance X_L and capacitive reactance X_C at resonance.
- (e) Calculate is the power consumed in the circuit.

(20 marks)

Question 3

A 25nF capacitor is connected in parallel with a single phase ac motor, which comprises of a coil of resistance 200Ω and inductance 0.20H across a 240V , 50Hz supply. Calculate

- (a) the current in the coil
- (b) the current in the capacitor
- (c) the supply current and its phase angle
- (d) the circuit impedance
- (e) the apparent power.

(20 marks)

Question 4

A motor has an output of 4.8kW, an efficiency of 80% and a power factor (PF) of 0.625 lagging when operated from a 240V, 50Hz supply. It is required to improve the PF to 0.95 lagging by connecting a capacitor in parallel with the motor.

Determine

- (a) the current taken by the motor
- (b) the supply current after power factor correction
- (c) the current taken by the capacitor
- (d) the capacitance of the capacitor
- (e) the kvar rating of the capacitor.

(20 marks)

Question 5

Each phase of a delta-connected load comprises a resistance of 40Ω and a $40\mu\text{F}$ capacitor in series. Determine, when connected to a 415V, 50Hz, 3-phase supply

- (a) the phase current
- (b) the line current
- (c) the total power dissipated
- (d) the kVA rating of the load.
- (e) States the advantages of three phase systems over single-phase supply.

(20 marks)

END OF QUESTION PAPER