



**UNIVERSITI KUALA LUMPUR**  
**MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY**

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**FINAL EXAMINATION**  
**JANUARY 2017 SEMESTER**

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**COURSE CODE** : LMB30303

**COURSE NAME** : MARINE OPERATION AND MAINTENANCE OF ELECTRICAL EQUIPMENT

**PROGRAMME NAME** : BACHELOR OF ENGINEERING TECHNOLOGY (HONS)  
(FOR MPU: PROGRAMME LEVEL) IN MARINE ENGINEERING

**DATE** : 05/07/2017 WED

**TIME** : 02.00 PM - 04.30 PM

**DURATION** : 2 HOURS 30 MINUTES

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**INSTRUCTIONS TO CANDIDATES**

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1. Please read CAREFULLY the instructions given in the question paper.
  2. This question paper has information printed on both sides.
  3. This question paper consists of TWO (2) sections; Section A and Section B. Answer ALL questions in Section A and THREE (3) questions from Section B.
  4. Please write yours answers on the answer booklet provided.
  5. Write your answers only in BLACK or BLUE ink.
  6. Answer all questions in English.
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THERE ARE 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

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## SECTION A: (Total 40 marks)

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

## Question 1

- (a) List the THREE (3) types of three phase source/load configuration (3 marks)
- (b) Determine the phase angle and circuit current for RC circuit (2 marks)
- (c) Explain ship electrical system (5 marks)
- (d) Determine the main requirement of installing an emergency generator on board ship. (2 marks)
- (e) There are particular essential services which are vital during a complete loss of main power. Name any THREE (3) essential services onboard ship. (3 marks)
- (f) Elaborate why the electrical power demand for ship vary according to the ship type and its day-to-day operational needs. (2 marks)
- (g) Ship engage in towing is one of the activities that is related with electrical power demand. State THREE (3) other types of ship activities in accordance with the operational needs and power demand. (3 marks)

## Question 2

- (a) State the purpose of maintaining the electrical equipment onboard ship. (2 marks)
- (b) Electrical safety is the key element for the ship personnel to comply when working with electrical or electronic equipment/system. Determine THREE (3) factors to minimize the safety risk to personnel and equipment during working. (6 marks)
- (c) Refer to Figure 1 below.
- Name the type of electrical system.
  - Name and explain the function of devices correspond to A, B, and C.
  - Sketch and label the waveform at D and E
  - In term of application, name the most suitable load or circuit for E.

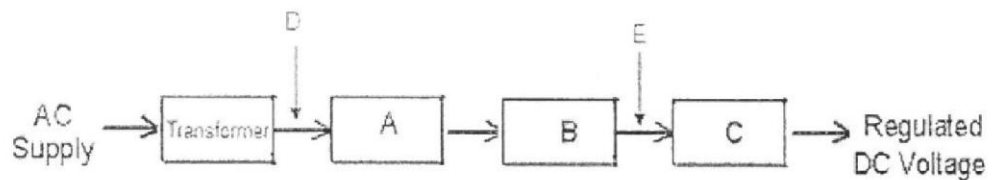


Figure 1

(12 marks)

## SECTION B (Total 60 marks)

INSTRUCTION: Answer THREE (3) questions only.

Please use the answer booklet provided

## Question 3

- (a) Explain the equipment or system associated with firefighting system onboard ship  
(4 marks)
- (b) Refer to Figure 2 below. Calculate
- Total impedance (polar)
  - Current (polar)
  - Voltage across the resistor, inductor and capacitor (polar)

(16 marks)

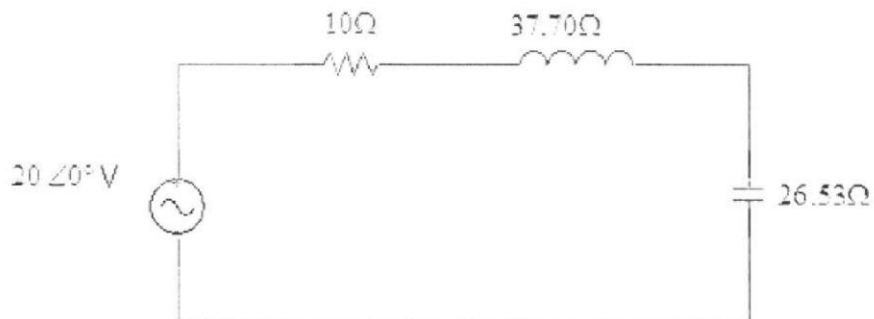


Figure 2

Question 4

Refer to Figure 3 below. Calculate the total number of watts, volt-amperes reactive, volt-amperes and power factor of the system.

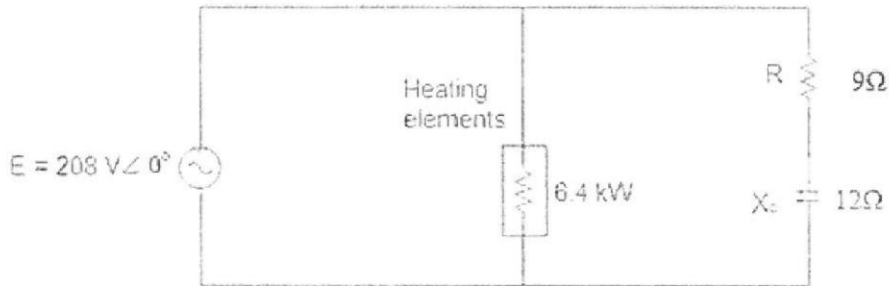


Figure 3

(20 marks)

Question 5

(a) Sketch and label the compound excitation circuit.

(10 marks)

(b) Name and explain the function of any THREE (3) sections on the main switchboard

(6 marks)

(c) Explain any TWO (2) procedures to carry out the connection of shore supply to the ship.

(4 marks)

Question 6

(a) Refer to Figure 4 below

- i. Name the type of ship electrical system
- ii. Identify A, B, C, D and E
- i. Explain the function of B

(8 marks)

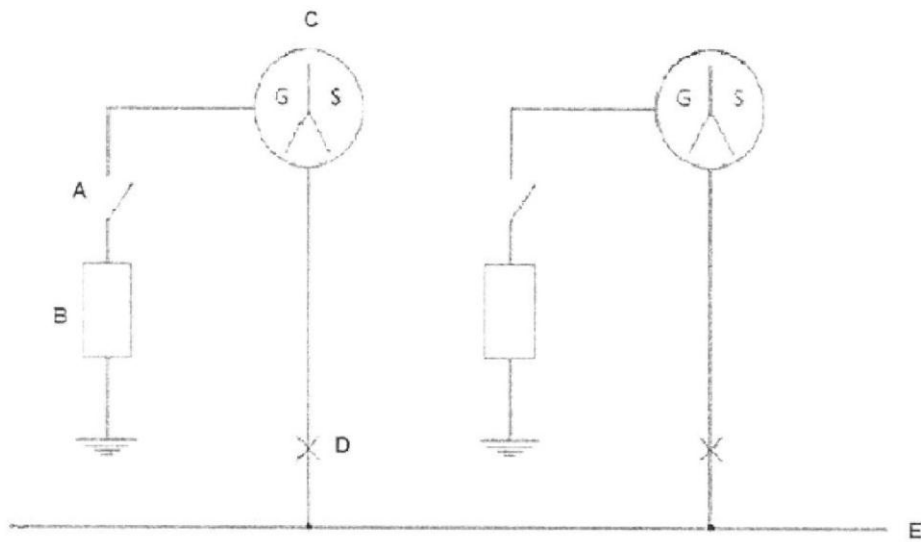


Figure 4

- (b) i. Name ONE (1) type of battery installed on board ship.
- ii. Determine the function of this battery.

(3 marks)

(c) Elaborate UPS.

(3 marks)

(d) Sketch, label and explain the standby UPS (during normal and emergency).

(6 marks)

END OF EXAMINATION PAPER