



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

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**FINAL EXAMINATION**  
**JANUARY 2016 SEMESTER**

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**COURSE CODE** : LEB 40303  
**COURSE NAME** : SHIP ELECTRICAL INSTALLATION  
**PROGRAMME NAME** : BACHELOR OF MARINE ELECTRICAL ELECTRONICS  
(FOR MPU: PROGRAMME LEVEL) TECHNOLOGY  
**DATE** :  
**TIME** :  
**DURATION** : 2 HOURS 30 MINUTES

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**INSTRUCTIONS TO CANDIDATES**

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1. Please CAREFULLY read the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of 5 questions.
4. Answer FOUR questions only.
5. Please write your answers on the answer booklet provided.
6. Answer all questions in English language ONLY.

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THERE ARE 5 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

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

**Question 1**

- (a) Describe the power distribution system on board ship.  
(5 marks)
- (b) During blackout the power supply normally taken over by the emergency generator. Explain the operation of the ship's emergency generator.  
(6 marks)
- (c) Define the following terms:  
i. Main source of electrical power  
ii. Normal operational and habitable condition  
iii. Dead ship condition  
(6 marks)
- (d) Describe  
i. Primary essential services  
ii. Secondary essential services.  
(4 marks)
- (e) State TWO (2) types of equipment for each category of essential services.  
(4 marks)

**Question 2**

- (a) Explain the effect of change in supply voltage on torque and speed  
(5 marks)
- (b) Elaborate the procedures and prominent equipment for the shore supply to be connected to your ship when alongside harbor.  
(10 marks)



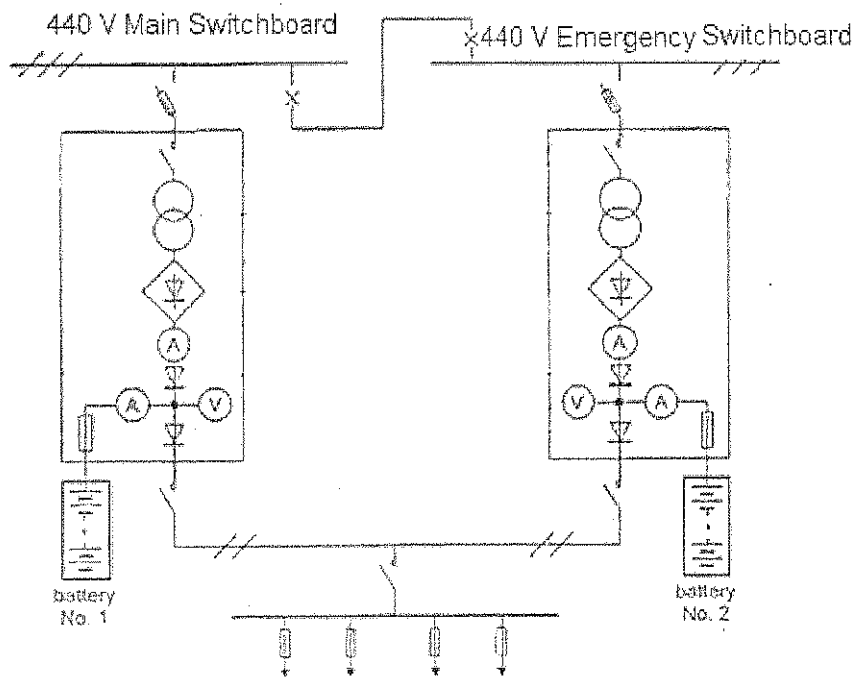
- (c) Sketch and label the circuit diagram of a shore supply arrangement. (10 marks)

**Question 3**

- (a) State THREE (3) essential services supplied by the batteries. (3 marks)

- (b) Specify THREE (3) conditions for battery installation onboard ship. (6 marks)

- (c) i. Determine the system in Figure 1  
 ii. Explain the operation of the system in Figure 1 (8 marks)



**Figure 1**

- (d) Explain the equipment running at increased voltage (380V-rated and running at 440 V)



(4 marks)

- (e) Explain the equipment that running or operate at a reduced frequency (60 Hz rated and running at 50 Hz)

(4 marks)

**Question 4**

- (a) State the importance of paralleling the generators

(2 marks)

- (b) A few parameters to be observed during generators' synchronizing. State these parameters.

(3 marks)

- (c) Specify the function of the synchroscope.

(2 marks)

- (d) Explain the procedures of paralleling generators.

(6 marks)

- (e) Two generators are load sharing in parallel:

Generator 1 delivers 500 kW at 0.8 power factor lag, and Generator 2 delivers 400 kW and 350 kVAR lag.

Calculate:

- i. the kVAR loading of Generator 1
- ii. the p.f. of Generator 2
- iii. the total bus bar loading in kW, kVAR and power factor.

(12 marks)

**Question 5**

- (a) State TWO (2) types of ship where the type of electrical system is high voltage.

(2 marks)





(b) A ship electrical system is categorized as an LV system. Sketch and label the layout of an emergency system in a typical ship electrical system .

(15 marks)

(c) Name TWO (2) types of protective devices.

(2 marks)

(d) Elaborate any THREE (3) functions of protective devices that are fitted in the ship distribution system

(6 marks)

END OF EXAMINATION PAPER

