

UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
JAN 2016 SESSION

SUBJECT CODE : LEB 20603
SUBJECT TITLE : MARINE ELECTRICAL CODE OF PRACTICES
LEVEL : BACHELOR
TIME / DURATION : 2½ HOURS
DATE :

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 FOUR (4) questions only.
 6. Answer all questions in English.
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THERE ARE 7 PAGES OF QUESTION PAPER INCLUDING THIS PAGE.

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

Question 1

- (a) Explain the importance and requirement of firefighting system onboard ship.
(5 marks)
- (b) Describe the ship electrical system.
(6 marks)
- (c) How does the generator being driven?
(3 marks)
- (d) Give TWO (2) examples of equipment that can be categorized under HV system
(2 marks)
- (e) In order to perform preventive maintenance, it must be supported with documents.
Name and explain three (3) types of documents that you know.
(9 marks)

Question 2

- (a) Elaborate the importance of ship's electrical diagram.
(2 marks)
- (b) Describe system diagram and wiring diagram.
(4 marks)
- (c) Elaborate the function of ship electrical distribution system
(2 marks)

- (d) Ship electrical system is operated by AC system or DC system. Explain THREE (3) advantages of AC system compare with DC system.
(6 marks)
- (e) Distribution systems at high voltages usually have their neutral points earthed through a resistor (NER) or earthing transformer to the ship's hull.
- i. State the main function of NER
 - ii. Sketch and label the neutral earthing in HV system
(8 marks)
- (f) An insulated distribution system is adopted for most marine electrical system. From your view why this system is more favourable than earth distribution system.
(3 marks)

Question 3

- (a) Determine the causes of faults develop (occur) on electrical equipment/system
(3 marks)
- (b) Define the 'breaking capacity' of the circuit breaker and the 'prospective fault current'.
(4 marks)
- (c) Describe briefly:
- i. Overcurrent protection
 - ii. Under voltage protection
(6 marks)

(d) A 415 V, 10 kW, 0.8 power factor 3 phase load is supplied as shown in Figure 1.

Calculate:

- i. Full load current (FLC) at load
- ii. The prospective fault current level at the load
- iii. Short circuit current level at the main switchboard
- iv. Identify the equipment A, B and C

(12 marks)

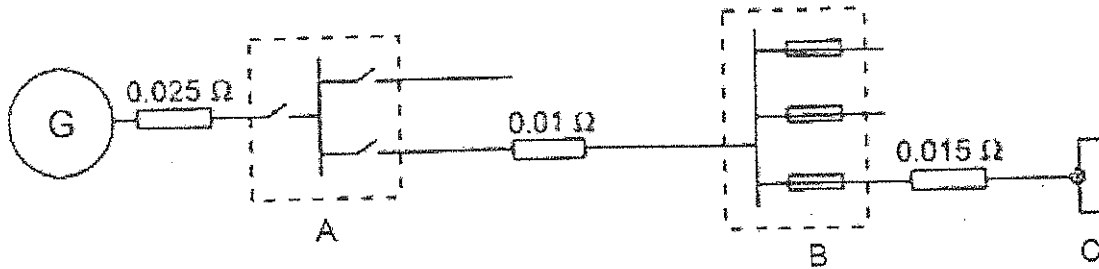


Figure 1

Question 4

(a) Specify TWO (2) reasons why lead acid batteries must never be placed near the alkaline batteries.

(2 marks)

(b) Describe THREE (3) factors to maintain batteries on board ship.

(6 marks)

(c) State TWO (2) occasion where the ship requires shore supply

(2 marks)

(d) Explain THREE (3) procedures of connecting shore supply to the ship.

(6 marks)

- (e) Design an emergency power supply. Your design should consist of.
- i. An emergency generator
 - ii. 440V emergency switchboard that feeds the 440V emergency consumers
 - iii. 440V/220V section board through a 3 ph transformer that feeds the 220V consumers

(9 marks)

Question 5

- (a) With the aid of diagram explain clearly how you conduct insulation resistance testing on ACU compressor motor.

(9 marks)

- (b) Sketch and label the continuous UPS system (normal and emergency).

(8 marks)

- (c) You are an electrical engineer of a well known shipyard in this country and has been tasked with your team to carry out survey on a cargo vessel KL BUNGAH. Describe briefly how your team conducts the survey works on the following equipment/system.

- i. Cables
- ii. Motors

(8 marks)

END OF QUESTION PAPER

