



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
SEPTEMBER 2016 SEMESTER

COURSE CODE : LMB 20503

COURSE NAME : MARINE ELECTRO TECHNOLOGY AND
MAINTENANCE

PROGRAMME NAME : BACHELOR MARINE ENGINEERING TECHNOLOGY
(FOR MPU: PROGRAMME LEVEL)

DATE : 17 JANUARY 2017

TIME : 09.00 AM – 12.00 PM

DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

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 **TWO (2)** sections; Section A and Section B.
 4. Answer **ALL** questions in Section A. For Section B, answer **THREE (3)** questions.
 5. Please write your answers on the answer booklet provided.
 6. Answer all questions in English language **ONLY**.
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THERE ARE 7 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)**INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****Question 1**

Lighting is very important on board ship. Luminance at work space will affect daily life and working environment.

- (a) With the aid of a diagram, show and label the voltage variation over one cycle from a 3 phase power supply. **(CLO 1)**
(6 marks)
- (b) List down THREE (3) Test Instrument that is being used during Electrical Installation and Repair. **(CLO 2)**
(3 marks)
- (c) List TWO (2) common types of lamps end cap. **(CLO 2)**
(2 marks)
- (d) List the FOUR (4) types of three-phase source/load configurations. **(CLO 1)**
(4 marks)
- (e) List FIVE (5) component being used in a STAR DELTA motor control circuit. **(CLO 2)**
(5 marks)

Question 2

Power Generation on board ship are very important. The current and voltage generated and consumed must be calculated precisely so that the generator is not overloaded.

- (a) A 440V / 110 V single phase transformer supplies a load of 5 kW at 0.8 factor load. Calculate secondary and primary currents (ignoring transformer power losses). **(CLO 1)**
(6 marks)
- (b) Protection of circuit is very important in electrical generation and distribution. Explain the function and protection provided by a Fuse. **(CLO 2)**
(2 marks)

- (c) List the voltage range supplied on board ship for domestic lighting and bow thruster. **(CLO 1)**
(2 marks)
- (d) An induction motor has 6-pole. It is supplied with 60 Hz frequency. It runs with a slip of 5%. Calculate the actual rotor speed of the induction motor. **(CLO 1)**
(6 marks)
- (e) Classify TWO (2) types of Emergency power supply available on board ship. **(CLO 2)**
(2 marks)
- (f) Estimate the current Rating for molded-case circuit-breakers (MCCB). **(CLO 2)**
(2 marks)

SECTION B (Total: 60 marks)**INSTRUCTION: Answer THREE (3) questions.****Please use the answer booklet provided.****Question 3**

Motor control play an important role in switching on various types of motor.

- (a) Analyze the diagram Figure 1 in Attachment 1. Describe the switching ON and OFF operation for the motor control and explain the function of all its component. **(CLO 2)**
(12 marks)
- (b) The rotor of a main AC generator provides the field excitation from its electromagnetic poles. Classify TWO (2) types of Rotor used on generators. **(CLO 1)**
(2 marks)

(c) Refer to the circuit in Figure 2. Discuss the 3 fault that occur in the circuit. Classify fault A, B and C. (CLO 3)

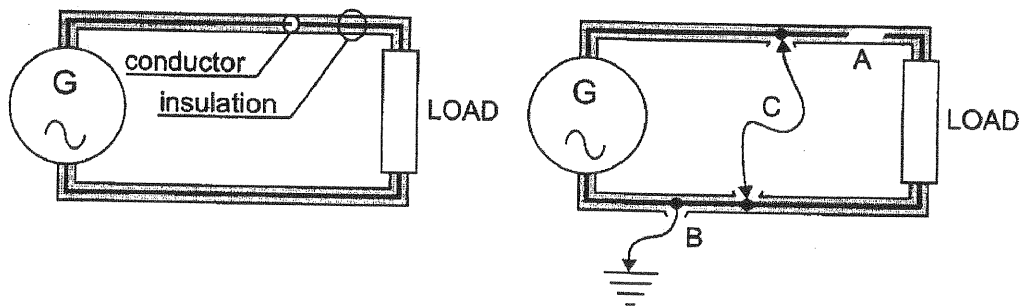


Figure 2

(6 marks)

Question 4

Magnetic fields are very important in motors and generators. Power can be supplied and motor can be operated.

(a) Analyze the diagram as shown in Figure 3. It is the most common lamp used for general lighting on board ship. State the name of the lamp and list down the component (a,b,c,d,e,f). (CLO 2)

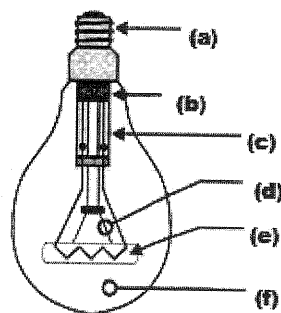


Figure 3

(7 marks)

- (b) Refer to the diagram in Figure 4, Interpret the ship distribution type. (CLO 2)

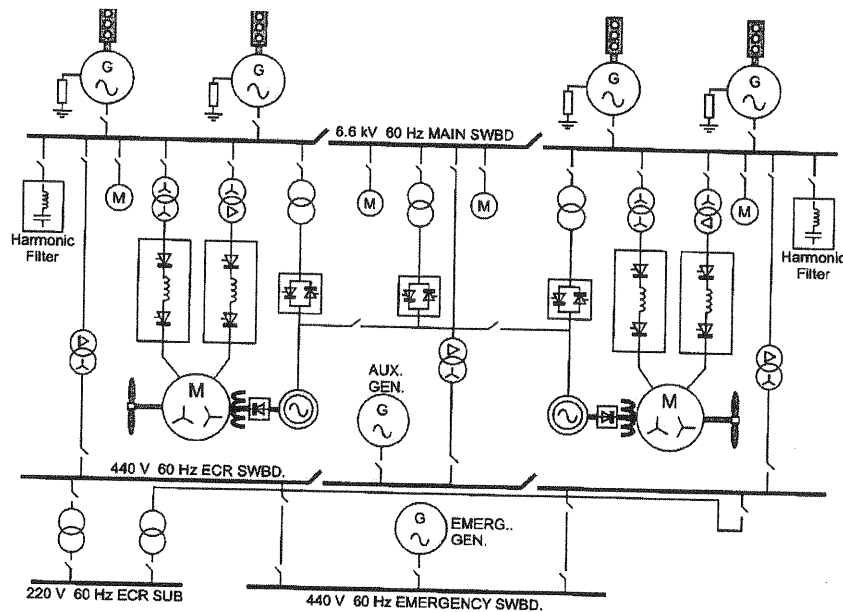


Figure 4

- (c) Identify FIVE (5) **ESSENTIAL SERVICES** onboard ship. (CLO 2) (2 marks)
- (d) Discuss how the generator **PREFERENCE TRIP** can be initiated. (CLO 2) (5 marks)
- (e) All electrical equipment or cable has insulation. State the purpose of **INSULATION**. (CLO 2) (4 marks)
- (f) All electrical equipment or cable has insulation. State the purpose of **INSULATION**. (CLO 2) (2 marks)

Question 5

Battery bank are also an important power supply. It will be used during Emergency situation.

- (a) Your ship generator is not giving the proper working voltage. Summarize the SIX (6) step that you should take to rectify the defect during trouble shooting or fault finding. (CLO 3) (6 marks)

- (b) Analyze the diagram in Figure 5. Describe the whole process / procedure that are being carried out. (CLO 3)

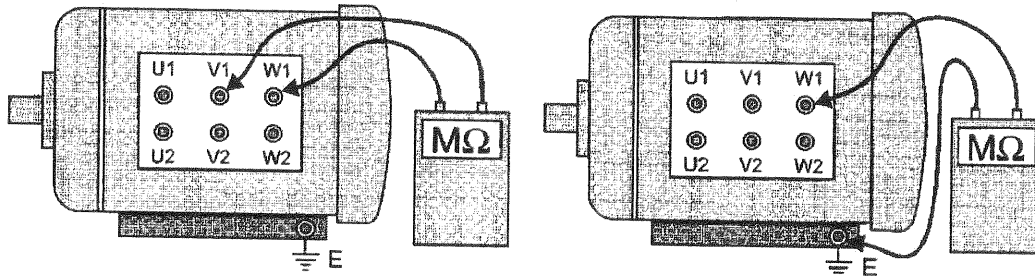


Figure 5

(6 marks)

- (c) On board Tankers, electrical safety is very important. Since most operation is using Electrical motor. Classify FOUR (4) types of motor enclosure available on board. (CLO 1)

(4 marks)

- (d) Electrical fire is very dangerous. Without any 3 element, fire cannot start. Illustrate the diagram of a FIRE TRIANGLE with its component. (CLO 2)

(4 marks)

Question 6

Maintenance is very important for Ship Operational. Without maintenance ship cannot sail smoothly.

- (a) General Electrical Maintenance are classified into 3 types of maintenance. Classify and describe all types of maintenance. (CLO 3)

(10 marks)

- (b) Analyze the diagram in Figure 6. Determine the type of monitoring system. (CLO 3)

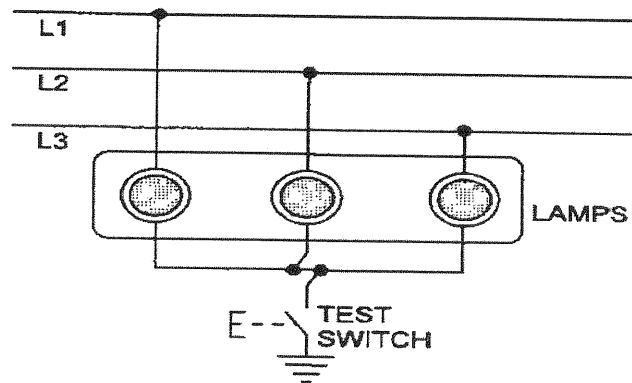


Figure 6

(2 marks)

- (c) Electrical circuit usually have electrical protection. List down 2 types of basic electrical protection provided. (CLO 2)

(2 marks)

- (d) With the aid of a diagram, illustrate the fluorescent and the glow starter circuit. The circuit should include Fuse, Switch, PFC, Ballast, Fluorescent Tube and a Starter Switch. (CLO 2)

(6 marks)

END OF EXAMINATION PAPER

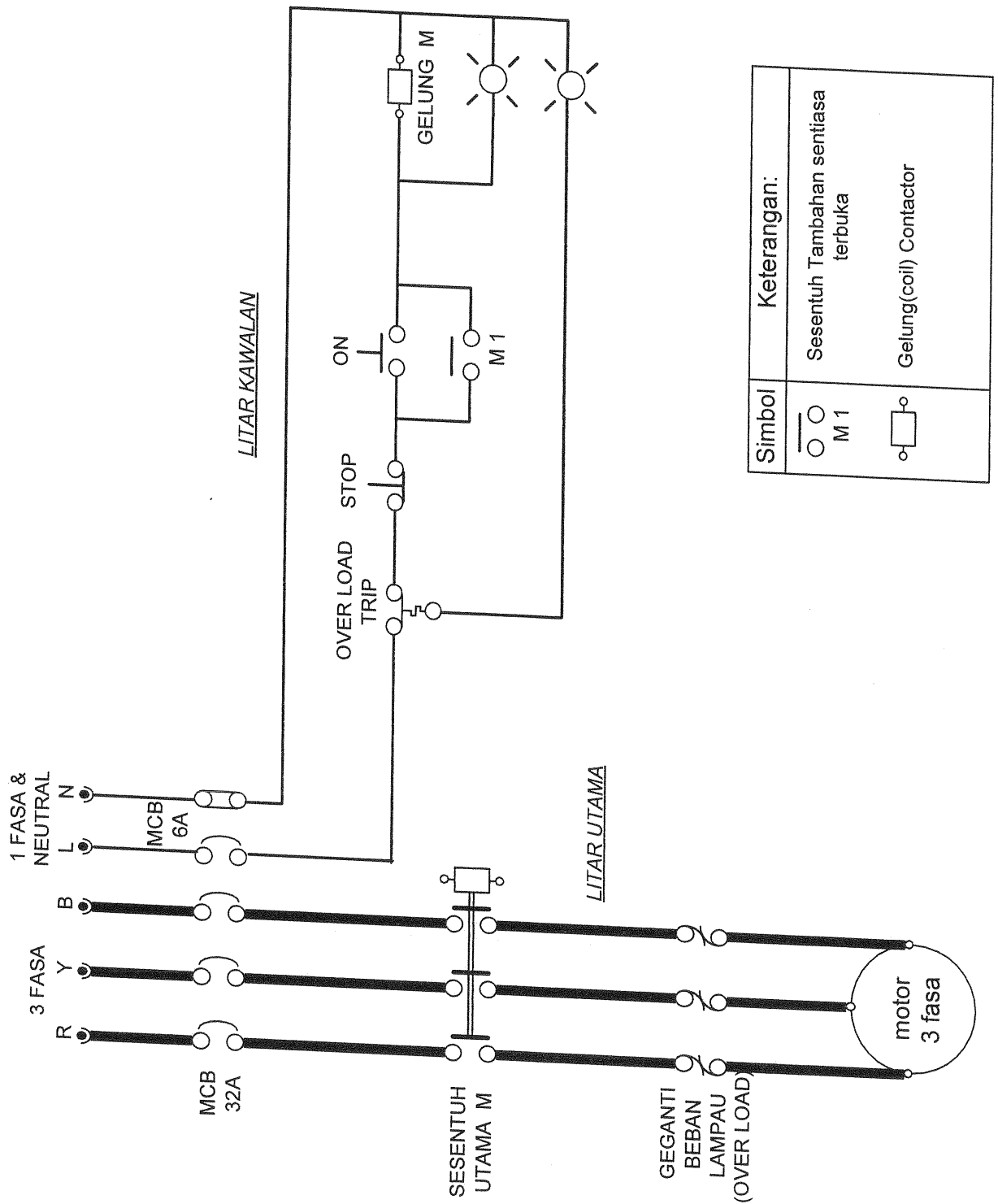


Figure 1