



UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
JANUARY 2016 SESSION

SUBJECT CODE : LDD 20402
SUBJECT TITLE : MARINE ENGINEERING SYSTEM 2
LEVEL : DIPLOMA
TIME / DURATION : (2 HOURS)
DATE : June 2016

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 only **TWO (2)** section. Section 'A' and Section 'B'. Answer all question in Section 'A' and **TWO (2)** questions only from Section 'B'.
 6. Answer all questions in English.
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THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

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

Question 1

- (a) Marine propellers are also known as "screws", is a mechanical device consist of blades attached to a shaft producing thrust that move the ship. Give four (4) technical terms to define the propeller characteristics. (4 marks)
- (b) Many ship nowadays consider of using more effective CPP propeller rather than FPP propeller. Explain (two) 2 differences of CPP and two (2) differences of FPP. (8 marks)
- (c) In order to choose suitable propeller, there are important criteria or factors taken into consideration before installing a propeller to the ship. Explain any four (4) criteria of propeller selection. (8 marks)

Question 2

- (a) The relationship between engine powers and pitch angle of the propeller must be properly calculated. Give two (2) reason behind it. (4 marks)
- (b) Describe the two (2) reasons why the design of four or five-bladed propellers and even more blades are usually selected and installed on the ship? (4 marks)
- (c) Explain two (2) reason how thrust force developed when the ship is sail on water. (4 marks)
- (d) Sketch and label any four (4) component of controllable pitch propeller (CPP) complete with shaft. (8 marks)

Question 3

- (a) There are certain requirements for the standard steering gear system that need to follow to ensure the ship will have a good and reliable maneuvering system. Explain briefly four (4) steering gear requirements.

(8 marks)

- (b) In general, a steering gear provides a movement of the rudder in response to a signal given from the bridge. Explain three (3) stages of steering gear system complete with diagram.

(8 marks)

- (c) Define the term stated below:

- i. Servomechanism.
- ii. Rudder.

(4 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer only TWO (2) questions.
Please use the answer booklet provided.

Question 4

- (a) List out three (3) desirable properties of refrigerants.

(3 marks)

- (b) Refrigerants will evaporate at low temperature and reasonable pressure and it will condense at a temperature near normal sea water temperature at a reasonable pressure. List out four refrigerants that are commonly used in refrigerant system?

(4 marks)

- (c) Briefly explain, why you need a refrigeration system onboard the merchant cargo ship?

(5 marks)

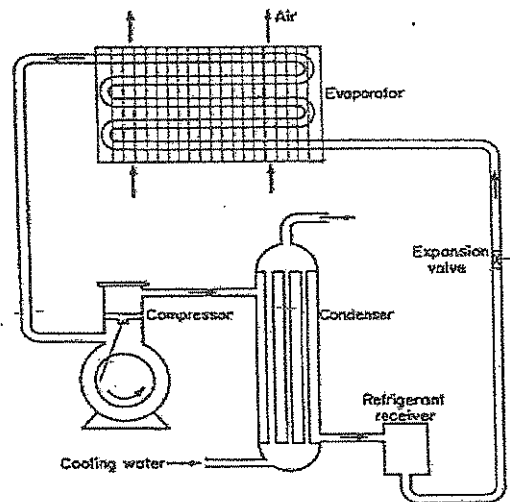


Fig. 1.0 Refrigeration circuit

- (d) Refer to figure 1.0, the basic component for refrigeration system, describes the basic working principal for the ship refrigeration system?

(8 marks)

Question 5

- (a) In performance Monitoring of a ship, list the product or system that deteriorates with use of time and it's critical to the vessel's safe operation that should be monitored?

(4 marks)

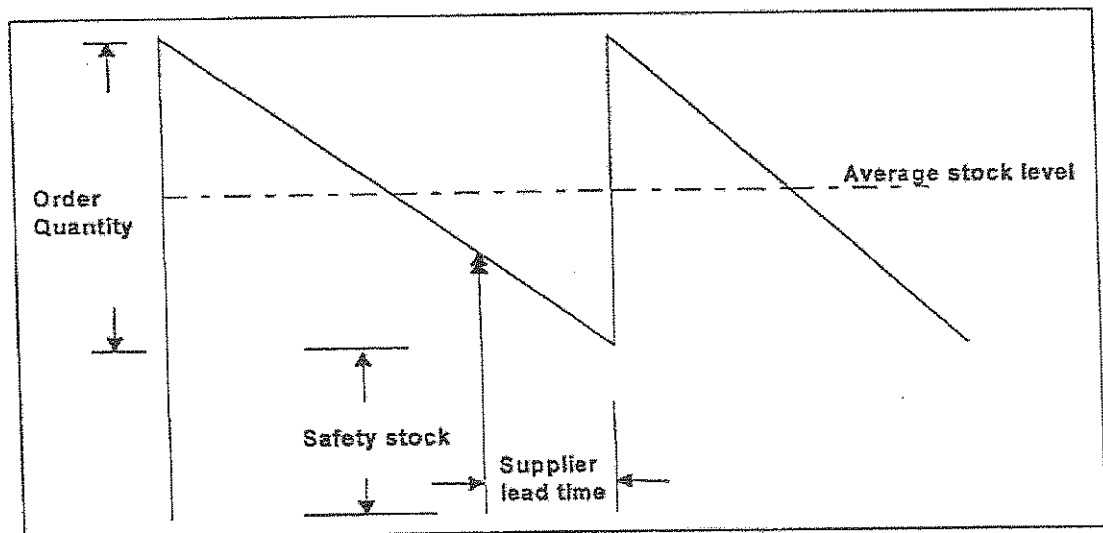


Fig. 2.0 Order Point

- (b) To control a spares onboard ship, stock must be keep with refer to order point charts as shown in figure 2.0, list out the factors to be considered in spares control reference and describe the average stock level?

(4 marks)

- (c) Explain the requirement of the complete set in commissioned data are important for ship undergo commissioning and describe where the measurement data should be recorded?
(4 marks)
- (d) List rotating or reciprocating machinery that has vibration factor and explain why the rotating and reciprocating machines require vibration analysis?
(8 marks)

Question 6

- (a) Describe planned Maintenance in your own words, what is the basis for your planned Maintenance System?
(5 marks)
- (b) Explain the meaning of maintainability for plan maintenance?
(5 marks)
- (c) A machine has 6000 running hours and total failure is 30. The failure rate is the reciprocal of MTBF, Calculate the failure rate and availability if total time repairs are 300 hours?
(10 marks)

END OF EXAMINATION PAPER