



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

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

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**COURSE CODE** : LMB40203

**COURSE NAME** : MARINE MACHINERY AND SYSTEM 2

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

**DATE** : 10/07/2017 MON

**TIME** : 9.00 AM - 11.30 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 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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**SECTION A: 40 MARKS**

**INSTRUCTION: Answer ALL questions.**

**Please use the answer booklet provided.**

**Question 1**

With reference **deck machinery** on board ship,

- a) Sketch and describe a power electrical driven windlass with which you are familiar.  
(12 marks)
- b) State 5 action taken to maintain the windless in good working order.  
(8 marks)

**Question 2**

With reference to a **controllable pitch propeller** on board ship,

- a) Sketch a typical controllable pitch propeller and explain its working principle.  
(10 marks)
- b) Examine the benefit and the drawback of employing a controllable pitch propeller  
( CPP ) (8 marks)
- c) Identify the two methods of operation of a vessel with CPP (2 marks)

**SECTION B: 60 MARKS****INSTRUCTION: Answer only THREE questions.****Please use the answer booklet provided.****Question 3**With reference to an **auxiliary low pressure boiler** on board ship,

- a) Sketch a diagrammatic arrangement of a typical single pass vertical composite smoke tube boiler naming clearly all the parts (6 marks)
- b) Sketch the lower parts of an improved high lift safety valve. (6 marks)
- c) Explain the working principle of the valve above. (8 marks)

**Question 4**With reference to **marine refrigeration** on board a merchant ship,

- a) Explain with aid of sketches the basic process of a Vapors Compression Refrigeration System using a Pressure Enthalpy Diagram. (5 marks)
- b) Sketch a Vapors Compression Refrigeration System naming the main components of the system including the controls and safety equipment incorporated in the system. (6 marks)
- c) Explain the effect of the refrigeration system when the following occurs
  - i. Air in the system
  - ii. Moisture in the system
  - iii. Oil in the system(9 marks)

**Question 5**

With reference to a **steering gear** on board a large marine merchant ship,

- a) Sketch a RAM type steering gear that used a variable displacement pump, labelling the various component of the steering gear and briefly explain how it operate in moving the rudder. (10 marks)
- b) Sketch a Smash Plate pump used in steering gear. (6 marks)
- c) Briefly describe the working principle of the pump. (4 marks)

**Question 6**

With reference to **marine boiler** on board ship,

- a) Explain the important of boiler water treatment. (6 marks)
- b) Distinguish different between permanent hardness and temporary hardness. (4 marks)
- c) Corrosion is one of the main problem that reduce reliability in boiler, describe the area that boiler are prone to corrosion. (6 marks)
- d) Discuss the corrosion above can be control. (4 marks)

**END OF QUESTION**