UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
SEPTEMBER 2016 SEMESTER

COURSE CODE	: LEB 30603
COURSE NAME	: NAVIGATION EQUIPMENT AND SYSTEM
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	: BACHELOR OF MARINE ELECTRICAL ELECTRONICS TECHNOLOGY
DATE	: 13 JANUARY 2017
TIME	: 3 PM
DURATION	: 2 HOURS 30 MINUTES

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 sections, Section A and Section B.
4. Answer ALL questions in Section A. For Section B, answer THREE (3) questions only..
5. Please write your answers on the answer booklet provided.
6. Answer all questions in English language ONLY.

THERE ARE 6 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total 40 marks)

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

Question 1

(a) Describe the differences between refraction and diffraction. **CLO 1**

(4 marks)

(b) Specify two (2) differences between ground wave and space wave propagation. **CLO5**

(4 marks)

(c) Sketch and label the sky wave propagation. **CLO 5**

(4 marks)

(d) Sketch the formation of electric field and magnetic field around an antenna. Explain your understanding on this configuration. **CLO 1**

(8 marks)

Question 2

(a) Explain the function of the following devices: **CLO 4**

i. Transducers

ii. Tuner

(4 marks)

(b) The gyroscope possesses two natural phenomena. Name these two phenomenas **CLO 2**

(2 marks)

(c) Explain 'gyro drift'. **CLO 2**

(3 marks)

(d) Describe the acronym GPS. **CLO 3**

(2 marks)

(e) Explain the L2C signal in terms of its usage and advantages. **CLO 3**

(5 marks)

(f) Noise present in the ocean adversely affects the performance of sonar equipment. Describe the TWO (2) main causes:of water noise. **CLO 4**

(4 marks)

SECTION B (Total 60 marks)

INSTRUCTION: Answer THREE questions ONLY.
Please use the answer booklet provided.

Question 3

(a) Calculate the directional gain in decibels [(G_{dir} (dB)] where the vertical beamwidth of a long range radar system is 15° and the horizontal beamwidth is 5°. **CLO 1**

(8 marks)

(b) Explain the importance (including function) of these components in the radar system. **CLO 1**

i. Receiver

ii. Synchroniser

(8 marks)

(c) The display unit of the radar system is designed to present the received information to an operator. Explain any ONE (1) of the two displays. **CLO 1**

(4 marks)

Question 4

(a) The bearing of the ship is given by the master gyro and its repeaters. Specify the location of the master gyro and three (3) other repeaters onboard ship. **CLO 2**

(4 marks)

(b) In a shipboard installation, the Gyro Compass system must be mounted in a complete set of gimbals to isolate it from three (3) factors. Explain these factors. **CLO 2**

(6 marks)

(c) i. Elaborate why does the same type of marine Gyro Compass installed onboard ship is impractical (not suitable) when installed in the aircraft.

ii. How to overcome the above problem. **CLO 2**

(5 marks)

(d) Explain the effect of the earth rotation on the Gyro. **CLO 2**

(5 marks)

Question 5

(a) Specify any THREE (3) output parameters at the receiver that appear at the GPS. **CLO 3**

(3 marks)

(b) i. Name the location of THREE (3) control stations

ii. Explain the operation of the control station. **CLO 3**

(8 marks)

(c) Discuss THREE (3) differences between GPS and DGPS. **CLO 3**

(6 marks)

(d) Explain the orbit injection phase. **CLO 3**

(3 marks)

Question 6

(a) Echo sounder is a marine instrument used primarily for determining the depth of water by means of an acoustic echo. Describe clearly how this system works. Include the functions of other components in your explanation. **CLO 4**

(5 marks)

(b) Explain the operation of continuous wave system for depth sounding. **CLO 4**

(5 marks)

(c) Name the sensor for: **CLO 4**

i. active sonar

ii. passive sonar.

(2 marks)

(d) Sketch and label the block diagram of passive sonar system. **CLO 4**

(8 marks)

END OF EXAMINATION PAPER