UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
JANUARY 2017 SEMESTER

COURSE CODE	:	LGB31603
COURSE NAME	:	MARINE POWER PLANT & AUXILIARY SUPPORT SYSTEM
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	BACHELOR OF ENGINEERING TECHNOLOGY (HONS) IN NAVAL ARCHITECTURE & SHIPBUILDING
DATE	:	10/07/2017 MON
TIME	:	02.00 PM - 04.30 PM
DURATION	:	2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES

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 FIVE (5) questions. Answer FOUR (4) questions only.
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.

THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

INSTRUCTION: Answer FOUR (4) out of FIVE (5) Questions

Question 1 (CLO 1)

With reference to marine internal combustion engine (ICE);

(a) Sketch a single line (block diagram) of a two stroke ICE. Also label the important components and explain the working principles of the system.

(15 Marks)

(b) The cylinder diameters of a 6-cylinder, 2-stroke diesel engine are 650mm and the stroke is 1120mm. The indicated mean effective pressure in the cylinders is 580kN/m^2 when the engine is running at 110 rev/min. Calculate the indicated power and the brake power if the mechanical efficiency is 86%.

(10 Marks)

Question 2

A boiler generates 5000kg of steam per hour at 18 bar. The steam temperature is 325°C and the feedwater temperature is 49.4°C. The efficiency of the boiler plant is 80% when using oil of calorific value 45 500 kJ/kg. The steam generated is supplied to a turbine which develops 500kW and exhausts at 1.8 bar; the dryness fraction of the steam is 0.98.

Determine:

(a) Mass of oil used per hour

(19 marks)

(b) Enthalpy drop through turbine (Δ h).

(6 marks)

Question 3

Referring to marine gas turbine engine (GTE);

(a) Explain it working principles with the help of ideal closed loop of Brayton Cycle.

(15 Marks)

(b) Sketch a single line (block diagram) of lubrication system for GTE. Also label it important components.

(10 Marks)

Question 4

With reference to a biological sewage system onboard a vessel;

(a) Sketch a single line (block diagram) of this system. Also label it important components.

(15 marks)

(b) Explain the system working principles.

(10 marks)

Question 5

With reference to a refrigeration system onboard a vessel;

(a) Explain FIVE (5) characteristic of good refrigerant.

(15 marks)

(b) Determine one (1) reason for the following abnormalities for the system.

i. Compressor knocking

(2 Marks)

ii. High discharge pressure

(2 Marks)

iii. Low discharge pressure

(2 Marks)

iv. Compressor frequently start and stop

(2 Marks)

v. Compressor continuous running without stopping

(2 Marks)

END OF EXANIMATION PAPER