



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

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

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**COURSE CODE** : LMB30103

**COURSE NAME** : MARINE BOILERS

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

**DATE** : 07/07/2017 FRI

**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 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.
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**THERE ARE 2 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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**INSTRUCTION: Answer FOUR (4) out of FIVE (5) Questions****Question 1 (CLO 1)**

Steam at a pressure of 60 bar and temperature of 500°C is fed to a steam turbine from a boiler. In the turbine, the steam is expanded isentropically to a pressure of 0.1 bar. The steam is then exhausted into condenser where it is condensed but not undercooled. The condensate is then pumped back into boiler, determine:

- (a) The supplied energy to the feed water per kilogram of steam generated  
(8 Marks)
- (b) The dryness fraction of the steam when entering condenser  
(8 Marks)
- (c) The Rankine efficiency  
(9 Marks)

**Question 2**

With reference to types of marine boiler;

- (a) Explain with the help of sketch and labels a boiler with natural circulation.  
(15 Marks)
- (b) Explains the advantages and disadvantages of circulation above compare to forced circulation.  
(10 Marks)

**Question 3**

With reference to boiler water level;

- (a) Explain with the help of sketch and labels, the essential difference in construction of plate-type water gauge for working pressures in excess of approximately 20 bar. (15 Marks)
- (b) Discuss the procedure for blow through boiler water level. (10 Marks)

**Question 4**

With reference to boiler fuel atomization and combustion:

- (a) Explain with the help of sketch and labels, the principal operation of pressure-jet burner. (15 marks)
- (b) Discuss the roof fired advantages compare to front firing. (10 marks)

**Question 5**

With reference to boiler water treatment:

- (a) Explains FIVE (5) the purpose of boiler water treatment. (15 marks)
- (b) Explains the purpose of antifoams and how they are usually applied. (10 marks)

**END OF EXANIMATION PAPER**