



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
JANUARY 2017 SEMESTER

COURSE CODE : LMB40103

COURSE NAME : MARINE STEAM TURBINE AND PLANT

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

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.
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THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

INSTRUCTION: Answer FOUR (4) questions ONLY.

(Total: 100 marks)

Please use the answer booklet provided.

Question 1

With reference to the construction of steam turbines:

- (a) Differentiate the construction of a 'built-up' rotor as compared to a 'gashed' rotor.
(5 marks)
- (b) Compare the advantages with the disadvantages of a turbine with a built-up rotor.
(5 marks)
- (c) Sketch a built-up rotor for an impulse turbine and show the parts.
(15 marks)

Question 2

With reference to steam turbine operation:

- (a) Outline the step by step procedures in turbine warming-through.
(10 marks)
- (b) Sketch and explain how the main steam turbines can be operated and run AHEAD with a damaged high pressure (HP) turbine.
(15 marks)

Question 3

With reference to turbine systems:

- (a) Sketch a typical 'pressure' turbine lubrication system line diagram and show the main components.
(10 marks)
- (b) Explain the purpose of the lube oil gravity tank in your sketch in (a) and discuss how it operates
(5 marks)
- (c) Discuss FIVE (5) ways on how to ensure that the lubricating oil is maintained in good condition.
(10 marks)

Question 4

With reference to steam turbine auxiliaries:

- (a) Discuss the function of the main condenser in a steam turbine propulsion plant.
(5 marks)
- (b) Determine FIVE (5) possible causes of loss of vacuum in the condenser.
(5 marks)
- (c) Sketch a typical regenerative condenser used in steam turbine propulsion plants.
(15 marks)

Question 5

A steam power plant operates on a simple ideal Rankine cycle between the pressure limits of 3 MPa and 50 kPa. The temperature of the steam at the turbine inlet is 300 deg C and the mass flow rate of steam through the cycle is 35 kg/s.

- (a) Show the cycle on a T-s diagram with respect to saturation lines (5 marks)
- (b) Calculate:
- i. the thermal efficiency of the cycle (10 marks)
 - ii. the net power output of the power plant (10 marks)

END OF EXAMINATION PAPER