UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

Final EXAMINATION (Set A : Question)
Sept. 2016 SESSION

SUBJECT CODE : LMB30103

SUBJECT TITLE : MARINE BOILER

LEVEL : BACHELOR

TIME / DURATION : 2½ HOURS

INSTRUCTION TO CANDIDATES

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1. Read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. Write your answers on the answer booklet provided.
4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
5. This question paper consists of TWO (2) sections. Section A and B.
6. Answer ALL questions in Section A. In Section B choose and answer only THREE (3) questions.
7. Answer all questions in English Language.

Section A : Consist of TWO (2) questions. Answer ALL TWO (2) questions.
Each question is 20 marks. Total mark is 40.

Question 1 :

Boiler furnace is very important to ensure high efficiency of boiler.
Construction of furnace wall are well developed in order to retain the heat.
By referring to marine watertube boiler ;

a) Sketch with complete label the 'Tangent Tube Arrangement' of furnace wall. (9 marks)

b) State the features of 'Tangent Tube Arrangement' compared to 'Monowall Tube Arrangement'. (3 marks)

c) State TWO (2) advantages of 'Tangent Tube Arrangement' (8 marks)

Question 2 :

Boiler mountings are compulsory to be fitted on the boiler.
By referring to Marine Watertube boiler ;

a) Define 'Boiler Mountings'. (2 marks)

b) Listdown FOUR (4) additional requirement of boiler mountings on watertube boilers. (4 marks)

c) Briefly describe the use of following boiler mountings : (14 marks)
   1. Safety valve
   2. Main steam stop valve
   3. Blowdown valve
   4. Air release cock
   5. Scum valve
   6. Sampling connection
   7. Pressure gauge connection

Section B : Consist of FOUR (4) questions. Answer any THREE (3) questions.
Each question is 20 marks. Total mark is 60.

Question 3 :

Safety valve is a compulsory fittings on the pressure vessel.
By referring to the safety valve for high pressure vessel ;

a) Make a complete sketch with label of a pilot operated safety valve. (10 marks)

b) Explain the operation of the pilot operated safety valve as sketch above. (10 marks)

Question 4 :

Fresh water generator is one of important machinery onboard a ship. Water produced from fresh water generator is used for drinking, cooking, washing and the most important is to supply the boiler water.
By referring to the Fresh Water Generator onboard ;

a) Sketch and label completely the fresh water generator system. (10 marks)

b) Describe the operation of the Fresh water generator that you have sketch above 4(a). (10 marks)

Question 5 :

LNG vessel uses steam turbine for its main propulsion. Steam is generated by main boiler. By referring to the steam system onboard LNG vessel :

a) Make a complete sketch of Steam Cycle Close Loop System, showing all major components together with complete labels. (10 marks)

b) Explain the reason of keeping the boiler water in alkaline state. (3 marks)

c) Suggest the method to prevent foaming problem that happen in the boiler drum. (2 marks)

d) State the chemical reaction equation which describe the process happened during the removal of Oxygen by using Hydrazine treatment. (5 marks)

Question 6 :

Main Condenser is an important equipment in the steam cycle system.
By referring to the 'Main Steam Close Loop System' onboard LNG vessel ;

a) Sketch with complete labels the Main Condenser. (10 marks)

b) Explain the importance function of following parts : (10 marks)
   i. Zinc Plate.
   ii. Expansion Joint.
   iii. Manhole.
   iv. Vent.
   v. Hotwell.

~ End of Questions ~