ACADEMIC YEAR 2023 - 2024

Program	Year	Semester	Paper
ME	3	1	MID TERM

MODULE NAME:	**Marine Power Plant-III**		
MODULE CODE:	**MPOWER-III**	**EXAM DATE:**	**05/11/2023**
TEACHER'S NAME:	**Hamid Soltani**	**DURATION:**	**1.5 hrs.**

Questions to be answered on:	**Allowed requirements:**	**Number of pages**
✓ Space provided on the question paper	Pen, Pencil & Calculator	(Incl. cover page)**: 8**

Points of attention:

- For each question, the maximum earned points are mentioned between brackets at the end of each question.
- Write very clearly! Answers that are not readable are not marked and don't get points!
- Make sure your answers are written to the point.
- All answers should be written **in English.**
- Write all the answers in **blue or black pen only.**
- Use the **pencil** only for **diagrams & graphs.**
- Show all the calculation steps in the given space.
- When finished submit the question paper, together with the answer scripts and the signed cover page to the invigilator.
- Any cheating/copying may result in an instant failing of the examination.

STUDENT NAME:

STUDENT ID:

FINAL MARKS

	42
	10

Number of answer scripts:……..……..

Invigilator:……..……..…..

Student's signature: ……..……

Time of receipt:……..…..

Answer All Questions (Total questions = 8)

Part1: Scenario [6 Marks]

You are the 3rd engineer aboard a cargo vessel. During a routine check, you notice that the soot blowing system hasn't been operated for several days, and there's a significant accumulation of soot in the EGE.

Question1:

Elaborate on the potential risks associated with not operating the soot blowing system regularly. Please provide only three reasons or sources of risk. Any additional reasons beyond three will not be awarded marks, even if they are correct. (2 marks for each reason/source listed with explanation , up to 6 marks) (6 Marks)

Part2: Scenario [6 Marks]

During a voyage, you are informed that the blowdown valves of the marine boiler are producing a banging noise when operated. Additionally, the drain pipe remains hot even when all valves are closed.

Question 2:

Based on the symptoms described, evaluate the condition of the blowdown valves. (2 Marks)

Question 3:

Describe the correct procedure to blow down the boiler, emphasizing the importance of the sequence. (4 Marks)

Part3: Scenario [8 Marks]

You are a marine engineer consultant, and a shipping company approaches you for advice on choosing between mono-wall and membrane wall tubes for their new marine boiler installation. They are particularly concerned about the long-term costs and maintenance implications of their choice.

Question 4:

Based on your expertise, compare and contrast the differences in terms of cost, fabrication, installation, and maintenance between mono-wall and membrane wall tubes. Exclude the aspects of high efficiency, radiant heat improvement, and refractory material requirement from your discussion. (8 Marks)

Part4: Scenario [9 Marks]

After a successful voyage, the ship is scheduled for a maintenance stop at the next port. As the chief engineer, you are responsible for ensuring the boiler is safely cooled down and prepared for the maintenance period.

Question 5:

Outline the procedure you would employ to cool down the marine boiler, ensuring the safety of the crew and equipment. (9 Marks)

Part5: Scenario [3 Marks]

During a voyage, the marine boiler's pressure gauge starts showing inconsistent readings. The safety of the crew and the vessel is paramount.

Question 6:

Evaluate the potential consequences of not addressing the inconsistent pressure gauge readings promptly. Additionally, suggest the immediate steps you would take to address the issue. (3 Marks)

Part6: Scenario [5 Marks]

You are the 3rd engineer on a cargo ship currently on a lengthy ocean voyage. The ship's boiler system has been continuously running to provide steam for propulsion and various onboard operations. As part of your responsibilities, you regularly inspect the boiler's condition. During a recent inspection, you discovered signs of wear and damage in some of the boiler tubes. You also noticed a decline in heat transfer efficiency within the boiler.

Question 7:
In the context of the scenario described, discuss the multiple factors that can lead to boiler tube failures and how these factors affect the boiler's heat transfer efficiency. Provide a detailed analysis of the situation. (detailed analysis of at least 5 factors) (5 Marks)

Part7 : [5 Marks]

Two types of the boiler tubes are used in most marine fire tube boilers. The plain tubes and stay tubes.

Question 8:

By using engineering drawing of sectional view, show the method that is used to install plain tubes in a marine fire tube boiler and mention names of important points to show the method of installation. (5 Marks)

MLO & Bloom's Level of Complexity

Q #	MLO Addressed	Complexity Level	Mark	Remark
Q1	**MLO 4**	Evaluating	**6**	
Q2	**MLO 4**	Evaluating	**2**	
Q3	**MLO 1 & 2**	Understanding /Application	**4**	
Q4	**MLO 1 &3**	Understanding /Analysing	**8**	
Q5	**MLO 2**	Application	**9**	
Q6	**MLO 3**	Analysing	**3**	
Q7	**MLO 3**	Analysing	**5**	
Q8	**MLO 2**	Application	**5**	