

EXAMINATION OF MARINE ENGINEER OFFICER

Function: Marine Engineering at Management Level

ENGINEERING MANAGEMENT

India	M.E.O. Class I (Aug 2023)	(Time allowed - 3hours) Total Marks 100
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NB: (1) Answer any SIX Questions

(2) All questions carry equal marks

(3) Neatness in handwriting and clarity in expression carries weightage

(4) Illustration of an Answer with clear sketches / diagrams carries weightage.

(5) Start answering from the backside of the front cover page

(6) Blank pages if any, to be struck off by (X) at the end of each question.

Q1. Maritime industries have taken several initiatives to explore new digital technologies and "Internet of things (IoT)" is one of such initiatives. With brief introduction on the principles of IoT, explain the following

- a) Advantages and Disadvantages of using IoT in maritime industry.**
- b) How IoT is changing the maritime industry.**
- c) How IoT is used in Energy Efficiency optimization and predictive Maintenance.**

Q2. What is Maritime Lien? How does this lien travel with property? Explain the associated terms "In Rem" and "In personam". Which convention deals with maritime lien? Give the order of settlement of various debtor's claims after legal action as per this convention.

Q3. Improvements in Rudder efficiency can considerably contribute to improving propulsion effectiveness. Discuss common rudder-efficiency improvements devices/ techniques currently in use, referring to the following:

- (a) Rudder Thrust Fins**
- (b) Asymmetric Rudders**
- (c) Rudder Bulbs**
- (d) Grim Vane Wheels**

Q4. On a ship where you are employed as Chief Engineer, the vessel has UMS system for controlling engine room and a central scanning and data logging system for monitoring. Explain the special attention you will pay to the specific data and formulate a chart for condition monitoring. Highlight the tools in computer application you will use for making graphical representation of the salient points and trend analysis.

- Q5. Classification societies as Recognized Organisations (RO) and play an important role in implementation of national and international regulations. State the limitations of the RO highlighting them with reasons. List the statutory services undertaken by a classification body on behalf of Administration.**
- Q6. A. Describe the stages during which the power produced by the main engine of the ship is transformed into the effective power.
B). Discuss the essential sea trial manoeuvres (navigation trials) conducted and typical objectives of each test.**
- Q7. List and explain the four main stages of an IMO convention. With examples, explain the delay that occurs between the adoption date and coming into force date of a convention. What can be done to reduce this delay.**
- Q8. Differentiate between annual, intermediate, renewal, damage and repair surveys. What are the purposes of each survey onboard? Also, enlist all statutory certificates carried onboard, their issuing authority, and the IMO Convention under which they are issued.**
- Q9. Referring to the IMO Instruments Implementation Code.**
- a) Briefly Discuss the objectives of the code and strategy recommended to flag state to achieve the objective. Which all IMO instruments covered in the code.**
 - b) What are the key performance indicators for evaluation of Flag state performance as per the code.**
 - c) Briefly discuss the Flag state, coastal state, and Port state responsibilities.**