

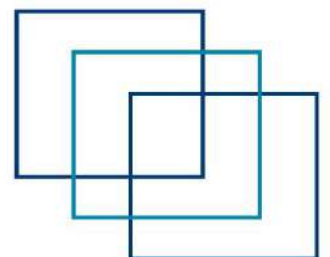


# **MEO CLASS 2**

# **WRITTEN: SSEP**

**(SHIP SAFETY & ENVIROMENTAL PROTECTION)**

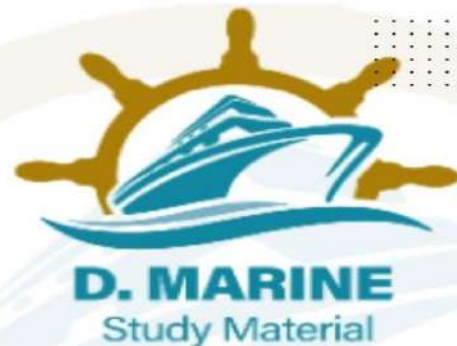
**FOR INDIAN COMPETENCY EXAM**



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**JAN-2023**

- Q1. a) What do you understand by the terms Convention, Protocol, Amendments? State in which order these will be adopted by the IMO? (10)  
b) What procedure is nowadays followed for putting the amendments into effect? (10)

**2022/SEP/Q1** **2023/JAN/01**

[Click Here to See the Answer](#)

- Q2. What are NO X & SOX limitations as per Annex VI of MARPOL. B. Briefly describe methods to control NO x emission and SO X emission.

**2023/JAN/Q2**

[Click Here to See the Answer](#)

- Q3. With reference to a lifeboat gravity davit arrangement:  
A. Sketch the arrangement showing the lifeboat both in the housed position and at its maximum point of outboard travel;  
B. Describe the lowering and raising of life boat stating the safety features and the requirement as per SOLAS 74, with respect to time for hoisting.

**2023/JAN/Q3**

[Click Here to See the Answer](#)

- Q4. Your vessel built after 01 st January 2000 and due for International Air Pollution Prevention Certificate renewal survey.

- a) How you will prepare yourself as 2nd Engineer for the renewal survey.  
b) What records, procedures, certificates etc. you will keep ready for attending surveyor verification.

**2023/JAN/Q4**

[Click Here to See the Answer](#)

- Q5. With reference to the following two types of dispersants explain what they are, and where are used:

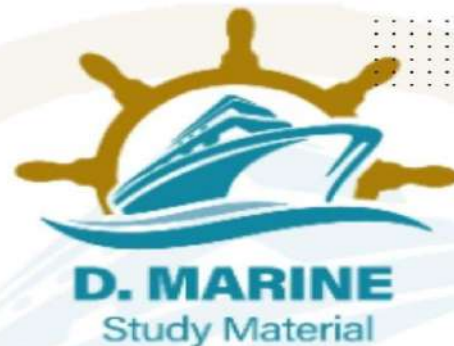
- A. Conventional dispersant; B. Concentrate dispersant.

**2023/JAN/Q3**

[Click Here to See the Answer](#)



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- Q6. With reference to the pumping of cargo tanks of chemical tankers-
- A. Sketch and describe an arrangement used with the cargo pump or independently of the pump, to facilitate tank drainage;
  - B. State significant regulation which will assist in reducing pollution of sea by chemical cargoes.
- c) Briefly describe the content of P & A manual.

**2023/JAN/Q6**

[Click Here to See the Answer.](#)

- Q7. a) Explain the factors that are considered in the development of critical equipment and systems onboard ship as per ISM code.
- b) Give your opinion on the importance of identifying critical equipment and systems onboard ship.

**2023/JAN/Q7**

[Click Here to See the Answer](#)

- Q8. a) Discuss the rights and expectations of seafarers in relation to occupational safety as per Maritime Labour Convention.
- b) What are the steps taken to reduce discrimination among seafarers due to differences in age, gender, language, nationality, and culture?

**2023/JAN/Q8**

[Click Here to See the Answer](#)

- 9.a) With reference to Port State Control, discuss (i) Regional cooperation /agreements.
- (ii) Future of port State control an effective tool for ship safety?
- b) Define a sub-standard vessel and give examples of detainable items under SOLAS, MARPOL, STCW and LL Conventions.

**2023/JAN/Q9**

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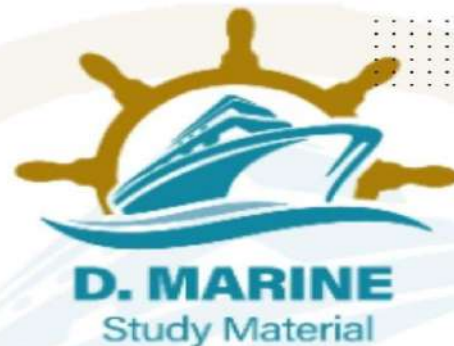
**FEB-2023**

- Q1. Explain the following terms used by the classification societies.
- a) Anniversary date.
  - b) Condition of class.





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- c) Window period for survey.
- d) Memoranda
- e) Addition note.
- f) Statutory recommendation.

**2023/FEB/Q1**

[Click Here to See the Answer](#)

Q2. With reference to Maritime Labour Convention (MLC) 2006, briefly discuss the following:

- a) Minimum requirements for seafarers working on a ship. B) Conditions of employment.
- c) Accommodation and recreational facilities. d) Health protection, welfare, and social security protection.

**2023/FEB/Q2**

[Click Here to See the Answer](#)

Q3. Explain the purpose of NOx Technical Code and its applicability to marine diesel engines. (7)

- b) Explain certification requirements under NOx Technical Code. (6)
- c) Explain the purpose of NOx technical file and its importance (6)

**2023/FEB/Q3**

[Click Here to See the Answer](#)

Q4. Fire protection for the accommodation spaces of passenger vessels incorporates means of detection, fighting and containment to reduce the spread of any fire.

- A. Describe the means of detection and firefighting commonly installed;
- B. State how the spread of fire is prevented and how the containment is used with the firefighting and detection arrangement to locate the fire.

**2021/JAN/Q4** **2021/FEB/Q4** **2022/NOV/Q6** **2023/FEB/Q4**

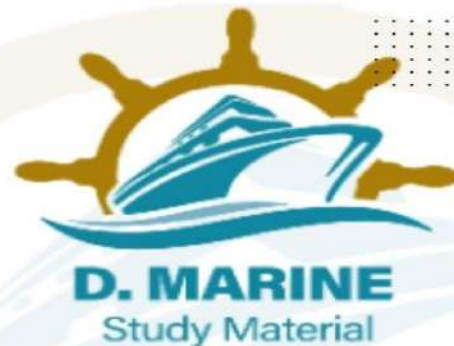
[Click Here to See the Answer](#)

Q5. A. Describe information which is available in the record which is attached as a supplement to the IOPP Certificate, for a bulk carriers and oil tanker.

- B. What are the provisions for engine room under MARPOL 73/78 Annex -1, for large ocean-going vessels?



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C. What is IBC Code and what Certificates are issued under the Code and to which ship?

**2022/OCT/Q6** **2023/FEB/Q5**

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Q6. A. Describe a vacuum sewage system;

B. With reference to the system described in

(A) - i. State ONE advantage of the system;

ii. State why a holding tank may be required to be fitted to the system;

iii. State the problems resulting from the retention of untreated sewage in a holding tank.

**2023/FEB/Q6**

[Click Here to See the Answer](#)

Q7) Illustrating differences between major nonconformity, nonconformity, hazardous occurrence and near miss situations, show with examples steps taken by you as Second Engineer in each case for successful handling of the situations.

**2023/FEB/Q7**

[Click Here to See the Answer](#)

Q8. With reference to Annex V of MARPOL 73/78, concerned with the prevention of pollution of the sea by garbage from ships:

A. Define the following terms;

(i) Garbage;

(ii) Nearest land;

(iii) Special areas:

B. State the regulations governing the disposal of garbage outside special areas.

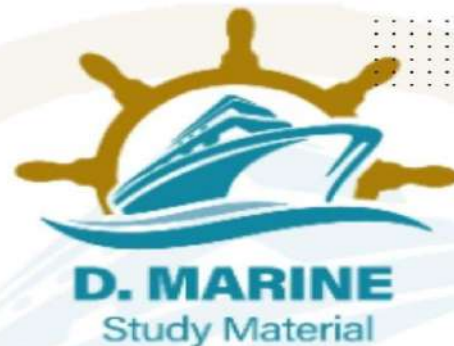
**2020/NOV/Q2** **2022/JUN/Q9** **2023/FEB/Q8**

[Click Here to See the Answer](#)

Q9. A. A hydraulically operated ballast tank valve situated in the duct keel has failed to close. State as Second Engineer your procedure for directing safe entry by engine room staff to the duct keel to ascertain the cause and possibility to carry out a repair.



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B. State if any procedure is to be followed before making an entry, and the relevant IMO code under which such procedures are required

**2021/AUG/Q1** **2022/JUN/Q2** **2023/FEB/Q9**

[Click Here to See the Answer](#)

### **MARCH-2023**

Q1. State the difference between Flag State control and port State control (PSC), under which International Conventions Port State Control be exercised. What do you understand by Memorandum of Understanding in respect of PSC? Name the different MOU's

**2022/OCT/Q8** **2023/MAR/Q1**

[Click Here to See the Answer](#)

Q2. With regard to minimum requirements for seafarers to work on a ship, as per MLC 2006, Write short notes on the following :-

- A) Seafarers' employment agreements (5)
- B) Entitlement to leave and repatriation
- C) Seafarer compensation in the event of a ship's loss or foundering (5)
- D) Career and skill development (5)

**2023/MAR/Q2**

[Click Here to See the Answer](#)

Q3. With reference to the pumping of cargo tanks of chemical tankers-

- A. Sketch and describe an arrangement used with the cargo pump or independently of the pump, to facilitate tank drainage; (10)
- B. State significant regulation which will assist in reducing pollution of sea by chemical cargoes.(10)

**2023/MAR/Q3**

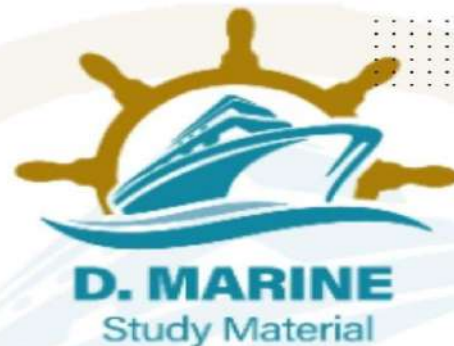
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Q4: With reference to Regulation 12 of SOLAS Chapter XII, dealing with Water Level Detection and Alarm System to spaces;

- A. type of ships water level detection and alarm system is required to be installed;
- B. Brief description of such installation;



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C. Requirements with respect to detection system;

D. Requirements with respect to alarm system.

**2022/OCT/Q7** **2023/MAR/Q4**

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Q5. (a) What different methods are used for preserving ship's hull during service. What type of antifouling coats are used. (8)

(b) State what materials are being banned by international regulation for use in Antifouling coats and the reason for banning. (6)

(c) Discuss briefly how does paint coating on deck differ from that on super structure. (6)

**2023/MAR/Q5**

[Click Here to See the Answer](#)

Q6. With reference to survey and certification of ship, briefly discuss the following

a) Harmonization of survey and certification (5)

b) Enhanced survey programme (ESP) surveys for bulk carriers and oil tankers (5)

c) Condition monitoring of tail shaft propeller shaft (5)

d) Periodical survey of ship (5)

**2022/SEP/Q9**

[Click Here to See the Answer](#)

Q7) Regulation 13F Annex I of MARPOL73/78 deals with prevention of oil pollution in the event of collision or stranding. Describe a double hull type of construction and state if any other type of construction provides equivalent protection (20)

**2023/MAR/Q7**

[Click Here to See the Answer](#)

Q8. Sketch and describe the following detectors, explaining their mode of operation and Stating where they would be fitted in the machinery spaces:

(a) Heat Detector

(b) combustion or smoke detector.

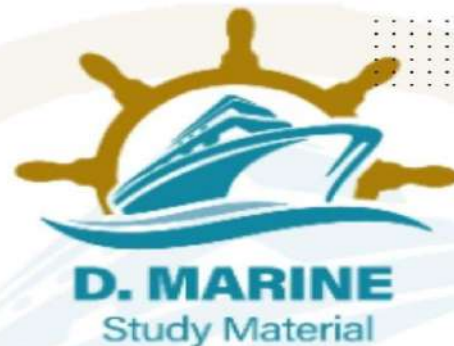
State the regulations that govern the fixing of these detectors. (20)

**2023/MAR/Q8**





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Q9. The international Safety Management (ISM) Code requires involvement and responsibility of the company in enforcing “emergency preparedness” procedures for a ship and its personnel. What advantage does it have under ISM Code? Describe the duties of the company in: -

- A. Forming the emergency team;
- B. Emergency situations;
- C. Maintaining contact between ship and office
- D. Use of ship’s relevant information

**2023/MAR/Q9**

[Click Here to See the Answer](#)

**APR-2023**

Q1. Name various statutory Certificates and Documents to be carried on board Chemical Tankers giving reference to the conventions and justify for their requirement.

**2023/APR/Q1**

[Click Here to See the Answer](#)

- Q2. A. Explain the principles underlying the STCW Convention;  
B. Explain how as a senior engineer you would implement the regulation for controlling and monitoring of minimum hours of rest for watch keepers;  
C. What type of specific shipboard familiarization is required to be given to a seafarer new to a particular type of vessel?

**2020/NOV/Q5** **2021/JAN/Q7** **2021/FEB/Q1** **2021/JUL/Q1**

**2022/JAN/Q9** **2022/MAR/Q2** **2022/JUL/Q6** **2023/APR/Q2**

[Click Here to See the Answer](#)

Q3. A. Draw a plan to deal with fire in accommodation, including co-ordination with shore facilities in port, taking account of the ship’s fire control plan;

B. Explain how drills and practices should be-organized with reference to the above.

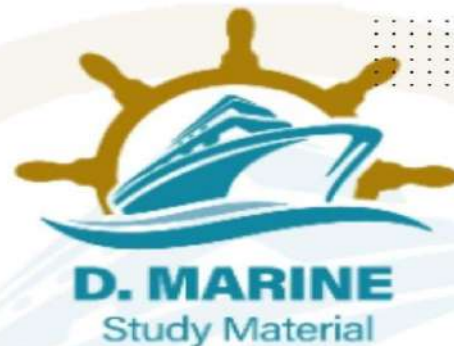
**2020/NOV/Q4** **2023/APR/Q3**

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- Q4. With respect to the hazardous areas of tankers,  
A. Explain the term flameproof (Ex d) for electrical equipment;  
B. State the type of electrical equipment that would be protected in this way.  
C. List likely defects of flameproof equipment.

2020/DEC/Q6 2021/FEB/Q5 2021/APR/Q7 2021/APR/Q6

2021/JUL/Q9 2022/APR/Q6 2023/APR/Q4

[Click Here to See the Answer](#)

- Q5. Define briefly the construction details peculiar to each of the following types of closure that enables their primary function to be fully realized:  
A. Water tight doors;  
B. Fire proof doors;  
C. Gas tight doors,  
D. With reference to above doors, State why  
(A) can perform function of (B) as well as of (C), whereas function of (B) and (C) are restricted solely to their primary function.

2022/MAR/Q7 2023/APR/Q5

[Click Here to See the Answer](#)

- Q6. With reference to "ISM Code" write short notes on:  
A. Masters Review,  
B. Requirement and Advantages of Familiarization of seafarer onboard,  
C. Designated Person Ashore (DPA)  
D. Functional requirements for a Safety Management System.

2023/APR/Q6

[Click Here to See the Answer](#)

- Q7. With respect to Bunkering operation onboard:  
A) As Second Engineer of a new ship, prepare standing orders for all future bunkering operations onboard.  
B. State why it is very important to obtain a representative sample of heavy fuel oil bunkered and State how a representative sample is obtained

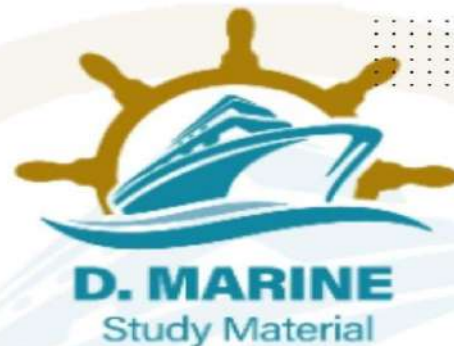
2022/MAR/Q8 2023/APR/Q7

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- Q8. Explain the following terms/statements: -



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- A. Categories of Noxious liquid substance;
- B. Special Areas as defined in MARPOL 73/78;
- C. Water Ingress Detection and Alarm System in Bulk Carriers;

**2021/JAN/Q2** **2021/MAR/Q6** **2023/APR/Q8**

[Click Here to See the Answer](#)

Q9. With reference to the Maritime Labour Convention (MLC) 2006, discuss the requirements for seafarers regarding: -

- A. Minimum age to work onboard vessels,
- B. Seafarer's Employment agreements
- C. Hours of work and hours of rest.

**2020/MAR/Q5** **2020/DEC/Q5** **2021/APR/Q5** **2023/APR/Q9**

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### **JUNE-2023**

Q1. For an ISM certification, explain the key clauses, which are required to be complied with obtaining Interim DOC, State the responsibility of a Second Engineer with respect to satisfactory implementation of SMS on board ship.

**2023/JUNE/Q1**

[Click Here to See the Answer](#)

- Q2. (a) Sketch a line diagram of a mechanical low expansion foam fixed firefighting system suitable for machinery spaces.
- (b) Describe the operation of the system sketched.
- (c) Explain how a mixture of foam making compound and sea water are converted into foam.
- (d) What are the periodic maintenance required on the system. (4)

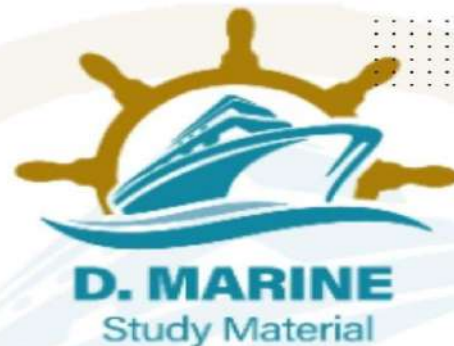
**2021/MAR/Q4** **2023/JUNE/Q2**

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Q3. India, one of the world's five major ship recycling countries, has acceded to the IMO Hong Kong Convention, the treaty that will set global standards for safe and environmentally sound ship recycling. Discuss the key features of "The Hong Kong International convention for the safe and environmentally sound Recycling of Ships".



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2021/FEB/Q2 2021/NOV/Q8 2022/JAN/Q5 2023/JUNE/Q3

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Q4. A. Sketch a simplified circuit that may be incorporated in a control panel for an array of fire detectors.

B. Describe the following features that may be found in a control panel for fire detectors:

- i) Audible fire alarm circuits;
- ii) Identification, of zone of fire;
- iii) Automatic change, over from normal power supply

2020/OCT/Q6 2021/JUL/Q6 2021/OCT/Q6 2022/NOV/Q9

2023/JUNE/Q4

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Q5. Prepare a proposal for safe manning requirements for a ship of your choice taking into account the IMO guidelines on the issue, also considering frequent port calls, rest hour management and high-risk areas.

2020/MAR/Q7 2020/OCT/Q4 2020/DEC/Q4 2021/APR/Q4

2021/JUL/Q5 2021/SEP/Q1 2021/OCT/Q1 2022/FEB/Q4

2022/APR/Q4 2023/JUNE/Q5

[Click Here to See the Answer](#)

Q6. Steering system failure has caused shipping casualties and oil pollution. Discuss

- a) The causes of such failure (8)
- b) The precaution necessary in design, operation, and maintenance of these systems. (6)
- c) Requirements on tankers, which was made mandatory after the shipping casualty. (6)

2023/JUN/Q6

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Q7. Explain the following with reference to MARPOL Annex-VI

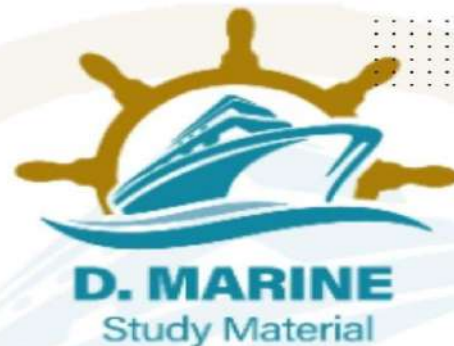
- a) Ozone depleting substances and its emissions control. (7)
- b) Volatile Organic and its emissions control. (6)
- c) NO<sub>x</sub> emissions and its control from ships. (7)

2023/JUN/Q7





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Q8: With reference to Regulation 12 of SOLAS Chapter XII, dealing with Water Level Detection and Alarm System to spaces.

- A. type of ships water level detection and alarm system is required to be installed.
- B. Brief description of such installation.
- C. Requirements with respect to detection system.
- D. Requirements with respect to alarm system.

**2022/OCT/Q7** **2023/MAR/Q4** **2023/JUNE/Q8**

[Click Here to See the Answer](#)

Q9. With reference to Port State Control:

- A. State the various MOU's and the purpose of having a port state control regime;
- B. Give at least 3 examples of deficiency which may lead to detention of your vessel;
- C. If your vessel gets detained by the PSC owing to a deficiency, what would be your action for redressal.
- d) What are the various deficiency action code used in PSC. (3)
- e) Briefly explain the difference between PSC and FSI. (3)

**2023/JUNE/Q9**

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**JULY-2023**

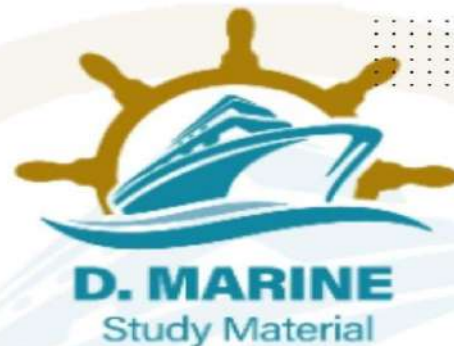
Q1. With reference to the 1978 SOLAS protocol, which outlines mandatory requirements for steering gear tests and drills?

- A. Describe the test procedure to be carried out within the, 12 hours before departure on a sea-voyage;
- B. Describe the emergency steering drills that must take place at least once every, 3 months;
- C. State how often the test in (A) and the drill in (B) should be carried out for ships which regularly engage on voyages of short duration.

[Click Here to See the Answer](#)



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Q2: A new instrument by IMO for the Control and Management of ships Ballast Water and sediments' will be in force in the near future. In relation to this discuss the following;

- A. The need for such a convention
- B. What are the options available for treatment of Ballast Water, and the methods being used presently?
- C. What are the responsibility as a flag State and port State?

[Click Here to See the Answer](#)

Q3. What statutory certificates need to be carried by an Indian flagged special trade passenger vessel? Name the certificates and state the validity of each of the certificates.

**2023/JULY/Q3**

[Click Here to See the Answer](#)

Q4: A. With reference to MARPOL 73/78, elaborate upon the Second Engineer's responsibilities with regard to –

- i) Avoidance of pollution near coastal and port areas;
- ii) Avoidance of pollution of port atmosphere with smoke.

B. With reference to SOLAS 74 as amended, discuss the following;

- i) How fire alarms are distinguished from other alarms;
- ii) The requirements for an emergency power supply

**2023/JULY/Q4**

[Click Here to See the Answer](#)

Q5. Referring to the Maritime labour Convention (MLC) 2006, discuss :-

- a) Flag State & Port State responsibilities. (5)
- b) On-board & On-shore Complaint Procedures. (5)
- c) Detainable deficiencies. (5)
- d) Grievance Redressal Mechanisms for Indian seafarers. (5)

**2023/JULY/Q5**

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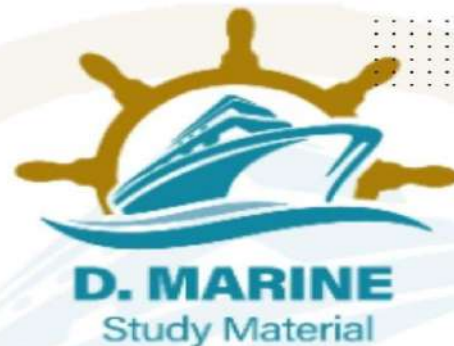
Q6. With reference to shipboard sewage systems,

A. Describe the principle of operation of EACH of the following types:

- I. Flow through system; II. Collection / Holding / transfer system; III. Zero discharge system.



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B. Explain why sewage systems involving aerobic action are to be preferred to those with anaerobic action.

**2023/JULY/Q6**

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Q7. With reference to equipment supplied to detect and combat hold fires in dry cargo ships:

- a) Describe, for a ship that carries dangerous cargo, the bridge-based detection arrangement, (10)
- b) Explain how fires described in (a) above are dealt with bearing in mind that cargo quantity varies. (10)

**2023/JULY/Q7**

[Click Here to See the Answer](#)

Q8. As per the international convention for prevention from ships state the regulation and the annex to MARPOL 73\78 which requires oil tankers and other ships to carry a ship board oil pollution emergency plan approved by the vessel flag administration. Discuss the mandatory requirement of SOPEP

**2023/JULY/Q8**

[Click Here to See the Answer](#)

9. List the objectives of an ISM Internal Audit of a ship? How an Internal Audit help in External Audit of a vessel? Name the salient issues addressed in the Internal Audit and the persons responsible to carry out the same. (20)

**2023/JULY/Q9**

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### **AUG-2023**

Q1. a) State the various documents pertaining to a ship that a port state control inspector would ask for during port state control inspection. (10)

b) If your vessel-gets detained by the PSC owing to a deficiency, what would be your action for redressal.

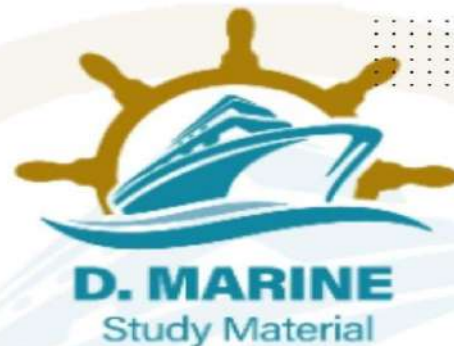
**2023/AUG/Q1**

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Q2. Prepare a proposal for safe manning requirements for a ship of your choice taking into account the IMO guidelines on the issue, also considering frequent port calls, rest hour management and high-risk areas. (16)

2020/MAR/Q7 2020/OCT/Q4 2020/DEC/Q4 2021/APR/Q4

2021/JUL/Q5 2021/SEP/Q1 2021/OCT/Q1 2022/FEB/Q4

2022/APR/Q4 2023/JUNE/Q5 2023/AUG/Q2

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Q3. Briefly discuss the following with respect to safety of navigation:

A. Bridge Navigation Watchkeeping Alarm System (BNWAS) (7)

B. Long Range Identification and Tracking of ships (LRIT) (7)

C. Voyage Simplified Voyage Recorder (VDR/S-VDR) (6)

2021/APR/Q8 2023/AUG/Q3

[Click Here to See the Answer](#)

Q4. Receiving of bunkers is an important aspect of a Senior Engineers responsibility

A. State the safety precautions that should be observed when bunkering; (5)

B. Explain the importance of taking samples when bunkering; (5)

C. Explain a preferred method of taking samples (5)

D. State the effect of each in a fuel oil – (5)

i. High density;

ii. High pour point;

iii. High water content

2023/AUG/Q4

[Click Here to See the Answer](#)

Q5. a) Discuss the rights and expectations of seafarers in relation to occupational safety as per Maritime Labour Convention. (10)

b) What are the steps taken to reduce discrimination among seafarers due to differences in age, gender, language, nationality, and culture? (10)

2023/JAN/Q8 2023/AUG/Q5

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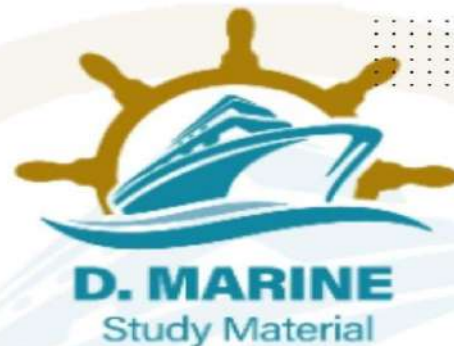
Q6. With reference to free fall lifeboat of an ocean-going ship:

A. Periodical maintenance, tests and checks on lifeboat and releasing gear. (6)

B. Secondary means of lowering. (5)



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C. Lifeboat Drills. (6)

2020/OCT/Q8 2020/DEC/Q2 2021/APR/Q4 2021/APR/Q2  
2021/JUL/Q2 2021/OCT/Q4 2021/DEC/Q3 2022/FEB/Q2  
2022/APR/Q2 2023/AUG/Q6

[Click Here to See the Answer](#)

Q7. A. State the hazards which may be encountered when entering an enclosed space and the precautions that should be taken. (8)

B. Sketch and describe an oxygen analyser which can be used to sample the atmosphere in void or closed spaces; (6)

C. Instruction given to junior as per the ISM procedures. (6)

2023/AUG/Q7

[Click Here to See the Answer](#)

Q8. With reference to arresting the headway of vessels of considerable mass, give reasoned opinions on EACH of the following statements:

A. Full power availability for astern running of the propeller is inconsequential; (7)

B. Results have been disappointing in those instances where rudders have been adapted to act as retarders; (6)

C. Discreet use of transverse thrust units may reduce stopping distance. (6)

2023/AUG/Q8

[Click Here to See the Answer](#)

Q9. Explain the purpose of NOx Technical Code and its applicability to marine diesel engines. (8)

b) Explain certification requirements under NOx Technical Code. (6)

c) Explain the purpose of NOx technical file and its importance (6)

2023/FEB/Q3 2023/AUG/Q9

[Click Here to See the Answer](#)

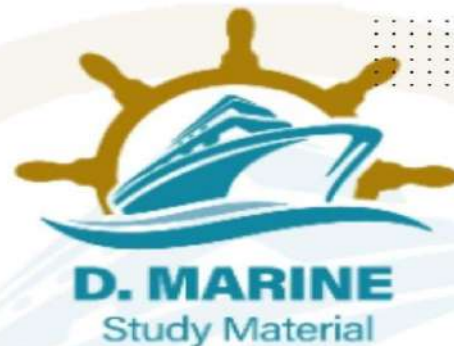
## SEP-2023

Q1. With reference to a periodically unattended machinery space of a dry cargo vessel discuss the requirements for.

A. Protection against flooding. (10)



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B. Control of propulsion machinery from the navigating bridge. (10)

2020/FEB/Q5	2021/JAN/Q8	2021/FEB/Q8	2021/MAR/Q1
2021/NOV/Q5	2022/JAN/Q4	2022/JUN/Q8	2023/SEP/Q1

[Click Here to See the Answer](#)

Q2. State the difference between Flag State control and port State control (PSC), under which International Conventions Port State Control be exercised. What do you understand by Memorandum of Understanding in respect of PSC? Name the different MOU's. (20)

2022/OCT/Q8	2023/MAR/Q1	2023/SEP/Q2
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[Click Here to See the Answer](#)

Q3. Steering system failure has caused shipping casualties and oil pollution. Discuss

- a) The causes of such failure (7)
- b) The precaution necessary in design, operation, and maintenance of these systems. (7)
- c) Requirements on tankers, which was made mandatory after the shipping casualty. (6)

2023/JUN/Q6	2023/SEP/Q3
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[Click Here to See the Answer](#)

Q4. With reference to an automatic water sprinkler, fire detecting alarm and extinguishing system for accommodation spaces: -

- A. (i) Sketch a typical system; (8)
- (ii) Describe the operation of this system; (4)
- B. State the sources of water available; (3)
- C. Describe the sprinkler head and its operation; (3)
- D. State how the temperature rating of the sprinkler head is determined. (2)

2020/OCT/Q1	2021/JAN/Q1	2021/APR/Q2	2021/JUL/Q2	2021/JUL/Q6
2021/DEC/Q6	2023/SEP/Q4			

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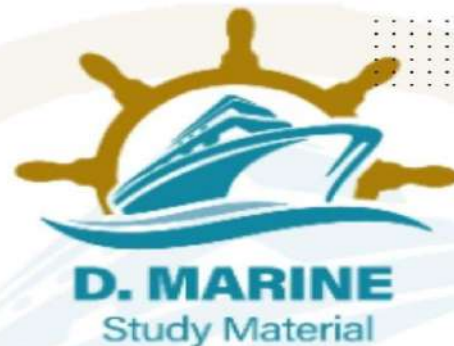
Q5. What is the purpose/objective of designating special areas under various Annexes of MARPOL convention? What are PSSA's and how are they different than designated special areas. (20)

2023/SEP/Q5
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Q6. Explain in detail a fixed gas fire extinguisher system, indicating the quantity of the fire-extinguishing medium, the controls required for the system, installation requirements and training required to bring the system to be readily operated. (20)

2020/FEB/Q1 2020/DEC/Q8 2021/FEB/Q6 2021/SEP/Q7  
2021/NOV/Q1 2022/MAR/Q3 2022/APR/Q8 2023/SEP/Q6

[Click Here to See the Answer](#)

Q7. With reference to MARPOL Annex IV

A. Draw a biological sewage treatment plant and explain the principal of operation. (10)

B. Periodical maintenance and checks and tests required to be done to verify the effectiveness of the above system. (10)

2021/JUL/Q8 2023/SEP/Q7

[Click Here to See the Answer](#)

Q8. A. State the instructions you as Second Engineer will give to watch keepers with respect to boiler uptake fire; (5)

B. State how the incidence of uptake fires may be minimized. (5)

C. State the reasons for blow-back from the furnace of an auxiliary boiler. (5)

D. State the standing instructions you might have received from your Chief Engineer With respect to the avoidance of boiler furnace blow-back. (5)

2020/OCT/Q3 2020/DEC/Q9 2021/MAR/Q2 2021/APR/Q9  
2021/SEP/Q3 2021/DEC/Q8 2022/JUL/Q9 2023/SEP/Q8

[Click Here to See the Answer](#)

Q9. With reference to survey and certification of ship, briefly discuss the following

a) Harmonization of survey and certification (7)

b) Enhanced survey programme (ESP) surveys for bulk carriers and oil tankers (7)

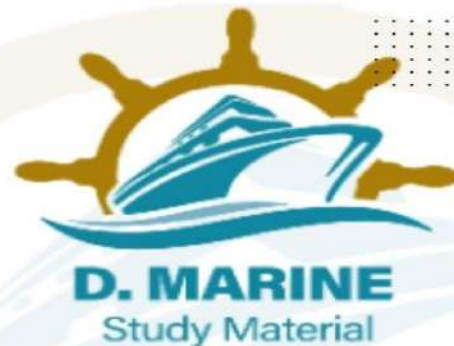
c) Condition monitoring of tail shaft propeller shaft (6)

2023/MAR/Q6 2023/SEP/Q9

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### OCT-2023

Q1. Petroleum vapours are dangerous substances and when mixed with air can be ignited.

- a) i) sketch an explosimeter or combustion gas indicator which can be used to check the atmosphere of a tank or pumproom. (6)
- ii) describe the explosimeter and its operation (4)
- iii) state one reason that may cause the explosimeter to give a false reading
- b) for flammable mixtures, explain the meaning of the terms lower and upper flammable limits. (6)

**2022/DEC/Q1**

[Click Here to See the Answer](#)

Q2. With respect to MARPOL 73/78, Annex - II, Noxious liquid chemicals are divided into categories;

- A. State the number of categories, and what does each category signify. (8)
- B. State the requirement of Procedures and Arrangements Manual, and what information is available.
- (c) What are the latest amendments in IBC code. (4)

**2022/DEC/Q2** **2023/OCT/Q4**

[Click Here to See the Answer](#)

Q3. With reference to Annex VI of MARPOL, what are the salient features of

- A. EEDI (Energy efficiency design index) (5)
- B. EEOI (Energy Efficiency Operational Indicator) (5)
- C. SEEMP (Ship Energy Efficiency Management Plan) (5)
- D. CII (Carbon Intensity Indicator) (5)

**2022/DEC/Q3** **2023/OCT/Q3**

[Click Here to See the Answer](#)

Q4. Explain how PSC is different from FSI? Discuss Clear Grounds under SOLAS, MARPOL and the STCW with examples. (20)

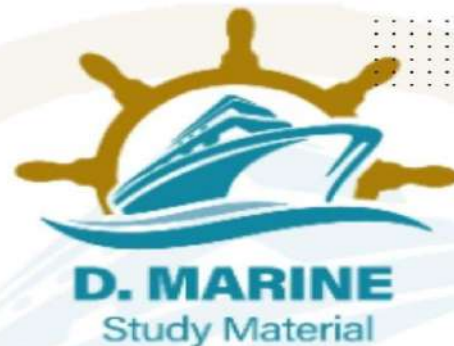
**2022/DEC/Q4** **2023/OCT/Q4**

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Q5. Discuss the following with respect to International Safety Management (ISM) code: (20)



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- A. Emergency preparedness, drills and training;
- B. Reporting of near miss, non-conformities, accidents/incidents and hazardous occurrences;
- C. Risk assessment Identification of critical equipment, tests and minimum spares requirement.

**2020/NOV/Q7** **2022/DEC/Q5** **2023/OCT/Q5**

[Click Here to See the Answer](#)

Q6. Discuss on the following with respect AFS Convention:

- a) Salient features and benefits of AFS Convention (5)
- b) Benefits of new generation TBT free paints (5)
- c) Survey and certification requirements for vessels GT 400 and above. (5)
- d) Survey and certification requirements for vessels GT less than 400. (5)

**2022/DEC/Q6** **2023/OCT/Q6**

[Click Here to See the Answer](#)

Q7. A. State where information can be obtained with regard to the safe carriage of hazardous substances as cargos. (4)

B. For a hazardous substance of your choice as a cargo, discuss each of the following;

- i) Storage and transport; (4)
- ii) Hazardous properties; (4)
- iii) Firefighting and suppression techniques; (4)
- iv) Medical effects and treatment after physical contact with cargo (4)

**2022/DEC/Q7** **2023/OCT/Q7**

[Click Here to See the Answer](#)

Q8. What are the core features of the FSS Code? (International fire safety systems code). Elaborate on any one test prescribed by the Code. (20)

**2022/DEC/Q8** **2023/OCT/Q8**

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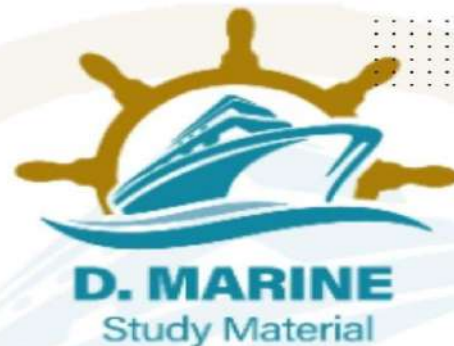
Q9. With reference to a recent ILO notice on the health hazards from asbestos.

- A. State where asbestos may be found on board ship.
- B. State the health risks from asbestos
- C. Outline the precautions necessary to minimize exposure to asbestos during an emergency repair.





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**2022/DEC/Q9** **2023/OCT/Q9**

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### NOV-2023

Q1. a) What do you understand by the terms Convention, Protocol, Amendments? State in which order these will be adopted by the IMO? (10)  
b) What procedure is nowadays followed for putting the amendments into effect? (10)

**2020/OCT/Q7** **2022/SEP/Q1** **2023/JAN/01** **2023/NOV/Q1**

[Click Here to See the Answer](#)

Q2. With reference to the pump room of an oil tanker describe the following with particular emphasis on safety aspects;

- (a) Ventilation system. (6)
- (b) Procedure to be followed for pump room entry. (7)
- (c) Lighting system. (7)

**2023/NOV/Q2**

[Click Here to See the Answer](#)

Q3. Explain the following with respect to MARPOL Annex-I

- a) Pump room bottom protection. (6)
- b) Intact stability of oil tankers. (7)
- c) Subdivision and damage stability of oil tankers. (7)

**2023/NOV/Q3**

[Click Here to See the Answer](#)

Q4. With reference to rescue boat and fast rescue boats, discuss the following:

- a) Requirements and equipment for rescue boat. (6)
- b) Additional requirements for inflated rescue boats and fast rescue boats. (7)
- c) Periodical maintenance & tests required for rescue boat and launching gear. (7)

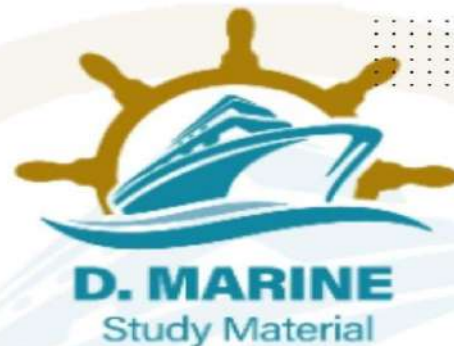
**2023/NOV/Q4**

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Q5. a) Draw and Explain flammability diagram. (5)



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- b) What is critical dilution in flammability diagram? (5)
- c) How does inert gas reduce flammability range (5)
- d) Describe purging and gas freeing operation of cargo tank in Crude Oil Tanker. (5)

**2022/AUG/Q6** **2023/NOV/Q5**

[Click Here to See the Answer](#)

Q6. a) Briefly describe the environmental impact of NO<sub>x</sub> & SO<sub>x</sub> and allowable limitations as per Annex VI of MARPOL in emission control areas and outside emission control areas.

- b) Briefly describe methods to control NO<sub>x</sub> emissions. (10)

**2022/AUG/Q1** **2023/NOV/Q6**

[Click Here to See the Answer](#)

Q7. With regard to ballast water Management Convention, Explain following:

- (a) Ballast water exchange standard. (4)
- (b) Ballast water Performance standard. (4)
- (c) Treatment methods for ballast water. (4)
- (d) Approval methods for treatment system using active and non-active substances. (4)
- (e) What are the marine pollution problems related to port development such as ballast water, dredging and spills from ships. (4)

**2021/OCT/Q7** **2022/FEB/Q6** **2022/SEP/Q3** **2023/NOV/Q7**

[Click Here to See the Answer](#)

Q8. With reference to MLC answer the following;

- a) Briefly discuss DMLC Part I and Part II covering the welfare points for seafarers. (10)
- b) Briefly discuss the grievance redressal mechanism for seafarers of Indian flagged vessel. (10)

**2022/SEP/Q2** **2023/NOV/Q8**

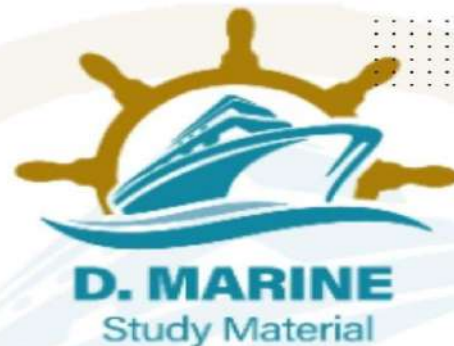
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Q9. A. Draw a plan to deal with fire in accommodation:

- a) Including co-ordination with shore facilities in port, taking account of the ship's fire control plan; (10)



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b) Explain how drills and practices should be-organized with reference to the above. (10)

**2020/NOV/Q4** **2023/APR/Q3** **2023/NOV/Q9**

[Click Here to See the Answer](#)

### DEC-2023

Q1. With reference to classification society's survey, explain the following:

A. Why a Class certificate is issued to a newly built ship after satisfactory completion of survey and sea trials, what is the purpose of a Class certificate?

B. Is it necessary to call a Class surveyor after repair or alteration to the ship's structure If so, why? (7)

C. Describe the requirement for initial and periodical survey respect to International Load Line. (7)

**2022/AUG/Q2** **2023/DEC/Q1**

[Click Here to See the Answer](#)

Q2. What is understood by risk on board a ship? As a second engineer discuss various methods for hazard identification and assessment of the potential risks on board. (20)

**2023/DEC/Q2**

[Click Here to See the Answer](#)

Q3. With respect to refrigeration gases used on-board vessels, answer the following:

a). Explain Ozone Depleting Potential (ODP) and Global warming potential (GWP) of conventional refrigerant gases. (7)

b). Name the alternate refrigerant gases available and being used on board.

c). Explain the steps you will take to ensure that release of refrigerant gases from the plant is minimized during normal operation and during maintenance activities. (6)

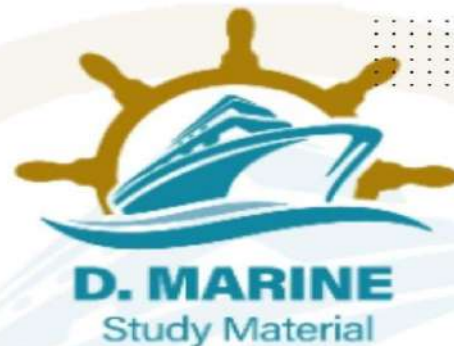
**2022/AUG/Q8** **2023/DEC/Q3**

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Q4. With reference to the Maritime Labour Convention (MLC) 2006, briefly discuss the following:

- a) Explain the key principles of the MLC about seafarers' rights and working conditions. (6)
- b) What measure does the MLC prescribe for seafarer's protection against harassment and bullying? (7)
- c) Explain the role of the flag State and Port State in enforcing MLC Regulations. (7)

**2023/DEC/Q4**

[Click Here to See the Answer](#)

Q5. A. State the instructions you as Second Engineer will give to watch keepers with respect to boiler uptake fire; (5)

B. State how the incidence of uptake fires may be minimized. (5)

C. State the reasons for blow-back from the furnace of an auxiliary boiler. (5)

D. State the standing instructions you might have received from your Chief Engineer With respect to the avoidance of boiler furnace blow-back. (5)

**2020/OCT/Q3** **2020/DEC/Q9** **2021/MAR/Q2** **2021/APR/Q9**

**2021/SEP/Q3** **2021/DEC/Q8** **2022/JUL/Q9** **2023/SEP/Q8** **2023/DEC/Q5**

[Click Here to See the Answer](#)

Q6. With reference to "ISM Code" write short notes on:

A. Master overriding authority. (5)

B. Requirement and Advantages of Familiarization of seafarer onboard, (5)

C. Designated Person Ashore (DPA) (5)

D. Functional requirements for a Safety Management System. (5)

**2023/DEC/Q6**

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Q7. With reference to SOLAS Chapter III,

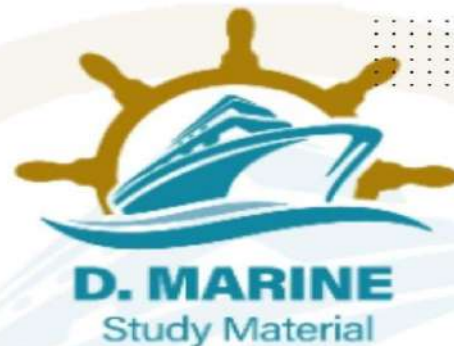
(a) List the items to be included in muster lists and emergency instructions.

(b) List the items which were contained in the training manual of your last ship. (4)

(c) Describe what maintenance are carried out on- board ships, of all life saving appliances. (6)



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(d) State the requirements for passenger muster stations. (3)

(e) Describe the frequency of fire drill and boat drill, and how they should be conducted. (3)

**2023/DEC/Q7**

[Click Here to See the Answer](#)

Q8. Prepare a proposal for safe manning requirements for a ship of your choice taking into account the IMO guidelines on the issue, also considering frequent port calls, rest hour management and high-risk areas. (20)

**2020/MAR/Q7** **2020/OCT/Q4** **2020/DEC/Q4** **2021/APR/Q4**

**2021/JUL/Q5** **2021/SEP/Q1** **2021/OCT/Q1** **2022/FEB/Q4**

**2022/APR/Q4** **2023/JUNE/Q5** **2023/AUG/Q2** **2023/DEC/Q8**

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Q9. With reference to activated fin stabilizers give reasons why:

(a) For large vessels such units are preferred to passive tanks; (6)

(b) These units are preferred for passenger and fast cargo ships; (6)

(c) Partial rather than maximum damping of ship movement in heavy weather is advisable for reasons other than overstressing of fin stocks and activating gear. (8)

**2020/FEB/Q6** **2021/JAN/Q9** **2021/NOV/Q6** **2022/FEB/Q8**

**2022/NOV/Q2** **2023/DEC/Q9**

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