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Note:

1) IAMI EK Question papers covered from 2017-2024.
2) The content included in this file is only for reference purpose and not for commercial gain.

1. BILGE, OWS & ORB

FEB 2024/AUG 2020

3)

State the MARPOL regulations for pumping engine-room bilges in special areas. (16)

MAY 2023/OCT 2022

3)

a) Describe the procedure for operating the oily water separator. (12)

b) State TWO ways that the separator could be made to operate more efficiently. (4)

MAR 2023/DEC 2022/JULY 2022/MAY 2021/FEB 2018

3)

a) State the operations which should be entered in the Oil Record Book of ALL ships. (12)

b) State the conditions that must be complied with for the discharge of oily water from machinery spaces. (4)

FEB 2023/MAY 2018

3)

With reference to the disposal of bilge water from the machinery spaces:

(a) Explain when it is NOT permissible to discharge the bilge water overboard, even via an oily water separator. (8)

(b) State the maximum permissible oil content of the overboard discharge. (2)

(c) Identify the documentation to be completed and state by whom following such an operation. (6)

JULY 2022/DEC 2017

5)

(a) Describe, with the aid of a sketch, the bilge injection system. (12)

(b) State the purpose of fitting a bilge injection system on board a ship. (4)

JULY 2021/DEC 2017

3)

Sketch an oily-water separator system that complies with present legislation. (16)

FEB 2020/DEC 2018

3)

With reference to the regulations relating to the pollution of the seas with oil, explain EACH of the following:

(a) the purpose of the Oil Record Book. (6)

(b) the action to be taken in the event of an oil spillage. (6)

(c) how the bilge water overboard discharge is monitored. (4)

OCT 2018

3)

(a) Describe the operating procedure for using a static oily water separator to discharge bilge water overboard. (12)

(b) State the effect that EACH of the following would have on the efficiency of the separator:

(i) the addition of heat to the separator. (2)

(ii) agitating the bilge water before it is pumped. (2)

DEC 2017

3)

(a) Name the International Convention that regulates the prevention of oil pollution at sea. (4)

(b) Describe how oily water from machinery space bilges is treated to ensure that the discharge complies with the convention mentioned in (a). (10)

(c) State the legal document that is required to comply with the convention mentioned in (a). (2)

MAR 2017

3)

(a) State the regulations that make each ship responsible for the prevention of pollution at sea and in port. (4)

(b) Name the equipment that must be used in machinery spaces to comply with Annex 1 of the regulations stated in (a). (2)

(c) Describe the principle of operation of the equipment named in (b). (10)

FEB 2017

3)

(a) State the entries necessary in the Oil Record Book when discharging bilge water at sea. (8)

(b) State FOUR precautions taken prior to taking bunkers. (8)

2. SEWAGE SYSTEM

OCT 2023/DEC 2021/MAY 2021/OCT 2019/JULY 2018

4) With reference to an aerobic sewage treatment plant:

(a) Explain the need for continuous aeration. (6)

(b) Describe the hazards that may be present when the plant requires internal maintenance or inspection. (10)

DEC 2020/FEB 2018/MAR 2017

4) Sketch an Aerobic Sewage Treatment Plant. (16)

3. HEAT EXCHANGER

FEB 2024/OCT 2021/OCT 2017

2) Describe, with the aid of sketches, a plate-type heat exchanger. (16)

DEC 2023/NOV 2023/JULY 2021

2) Sketch a cross-section of a horizontally mounted two-pass, tubular heat exchanger suitable for lubricating oil cooling, showing the flow path of the fluids, and labelling all parts. (16)

MAY 2023/MAR 2018

2) State FOUR advantages and FOUR disadvantages of plate-type heat exchangers. (16)

DEC 2022/DEC 2019/DEC 2017

4) With reference to a steam heating coil in a fuel storage tank developing a leak:

(a) State how the leak would be detected. (4)

(b) State the immediate action to be taken when the leak is detected. (4)

(c) Explain how the leak may be traced. (8)

4. PUMP SYSTEMS

JULY 2022/DEC 2019/DEC 2018

2) With reference to a gear pump suitable for use with fuel or lubricating oil:
(a) Sketch a cross-section indicating the flow of fluid. (6)
(b) Explain the operating principle. (4)

MAY 2017/OCT 2019

2) List EIGHT reasons why a bilge pump may not be able to remove water from an engine room bilge. (16)

FEB 2019/JULY 2017

2) With reference to centrifugal pumps:
(a) explain why large pumps should be started with the discharge valve closed. (8)
(b) state FOUR possible reasons for failing to achieve suction from a double bottom tank. (8)

5. PURIFIERS AND SYSTEM

MAY 2024/MAR 2023/DEC 2021

2) Describe, with the aid of sketches, the principle of centrifugal separation as used in fuel and lubricating oil purifiers. (16)

MAY 2018

2) With reference to centrifugal purifiers:
(a) state the function of the gravity disc. (4)
(b) explain the consequences of EACH of the following:
(i) gravity disc too large. (6)
(ii) gravity disc too small. (6)

DEC 2017/MAY 2017

2)
(a) Outline the separation process that occurs within centrifugal oil purifiers. (12)
(b) Explain the change required for a non-ALCAP type purifier if it is to be used for oil of lower density. (4)

FEB 2023/OCT 2023/MAY 2019

2) With reference to the treatment of lubricating or fuel oil:
(a) State the function of a purifier. (4)
(b) State the function of a clarifier. (4)
(c) State TWO constructional differences found in the bowls of purifiers and clarifiers. (8)

DEC 2022/DEC 2020/FEB 2018

2)

(a) Explain TWO factors that have an influence on the separating process within a centrifugal purifier. (8)

(b) Explain TWO reasons for a purifier not attaining full running speed. (8)

6. REEFERIGERATION AND A/C

MAY 2024

4) With reference to a vapor compression refrigeration cycle, describe TWO main symptoms of and remedies for EACH of the following:

(a) Undercharge. (4)

(b) Overcharge. (4)

(c) Air in the system. (4)

(d) Moisture in the system. (4)

OCT 2022/MAY 2021/AUG 2020/JULY 2018

2) With reference to a refrigeration system:

(a) Describe how air is removed from the system. (8)

(b) Describe how and where refrigerant gas is added to the system. (8)

JULY 2019/OCT 2020/FEB 2017

2)

(a) Sketch a simple refrigeration system showing the FOUR major components (8)

(b) State the condition of the refrigerant between EACH component in the sketch of (a). (8)

FEB 2020

2) With reference to a refrigeration system, state the indications of EACH of the following faults:

(a) air in the system. (8)

(b) undercharge of refrigerant gas. (8)

7. FIRE

DEC 2023/NOV 2023/OCT 2023/MAR 2023/MAR 2018/JULY 2017

5) Describe the routine inspection of the portable fire extinguishers found in the machinery spaces. (16)

FEB 2023/OCT 2019/MAY 2017

5)

(a) Describe the maintenance required by EACH of the following portable fire extinguishers.

(i) CO_2. (6)

(ii) Dry Powder. (6)

(b) Describe the procedure and the frequency of the maintenance for the fire detection system. (4)

DEC 2022/DEC 2021

5)

(a) With reference to contents and use, describe how a portable fire extinguisher is identified. (4)

(b) State, with reasons, the type of fire extinguisher normally found in the engine control room. (4)

(c) List the actions to be taken prior to the operation of a bottled CO_2 fire-fighting system. (8)

OCT 2022/DEC 2020/FEB 2019

5) In the event of discovering a fire in the machinery space, as EOOW, list the actions to be taken after EACH of the following situations:

(a) Finding a fire in its early stages. (6)

(b) Finding a fire that has become too hazardous to fight. (10)

JULY 2022/OCT 2020/MAY 2018

1)

(a) State FOUR actions the Engineer Officer of the Watch would take on discovering a small oil fire in the engine room bilge. (8)

(b) State FOUR good watchkeeping practices that can help prevent such fires mentioned in (a) from occurring. (8)

OCT 2021/FEB 2020

5)

(a) List FOUR different types of fire detector head that may be fitted to the Fire Detection System. (4)

(b) Describe the principle of operation of TWO of the fire detector heads listed in (a). (12)

MAY 2024/FEB 2018/AUG 2020

5)

(a) Explain the importance of regular fire drills. (8)

(b) Describe how a drill relating to a fire in a purifier room may be organised. (8)

MAY 2024/OCT 2019/FEB 2020

1) Explain the actions that the Engineer Officer of the Watch should take on discovering the lagging on the main engine exhaust within the tunnel spaces was on fire. (16)

DEC 2019

5) State, with a reason, TWO types of portable fire extinguisher that may be used to fight a fire in EACH of the following shipboard areas:

(a) Galley; (4)

(b) Accommodation space. (4)

(c) Machinery space control room. (4)

(d) Main electrical switchboard. (4)

JULY 2019

5) Describe actions to be taken to operate a bottled CO_2 fixed fire-fighting system from deciding that the system should be used to the release of the CO_2 (16)

OCT 2018

5)

(a) Describe the immediate action that should be taken in the event of discovering a fire in the accommodation spaces, whilst at sea. (8)

(b) Briefly describe the organisation of the TWO main emergency parties on board a ship. For EACH party state who is in charge, their responsibility and how their efforts are co-ordinated. (8)

OCT 2017

5)

(a) Name FOUR types of portable fire extinguishers that may be found in the machinery space onboard the ship. (4)

(b) Explain which of the extinguishers named in (a) may be found in the machinery control room. (7)

(c) State the fire classifications, including the type of material involved with EACH. (5)

8. ENCLOSED SPACE

MAY 2021/MAY 2019/DEC 2018

5)

(a) Define the term "Enclosed Space" (3)

(b) State THREE areas on board a ship that would designate as an enclosed space. (3)

(c) Describe the procedure for the entry into an enclosed space. (10)

MAY 2023/JULY 2021/OCT 2020

5)

(a) State the meaning of the term enclosed space. (4)

(b) Explain the procedure for preparation for entry into a cofferdam prior to an inspection. (12)

9. LIFE-SAVING APPLIANCE

MAR 2023/JULY 2022/OCT 2021/FEB 2019/JULY 2017

4)

(a) State FOUR features that assist in the starting of lifeboat engines in cold climatic conditions. (8)

(b) Briefly describe TWO devices that control the rate of fall of a lifeboat when launched from standard davits. (8)

10. LIFTING EQUIPMENT

MAY 2018/MARCH 2017

5) State the safety checks needed before using EACH of the following lifting gear, assuming that all certificates are in order and the equipment load capacity is sufficient for the lift:

(a) Wire strops. (4)

(b) Chain blocks. (4)

(c) Eye bolts. (4)

(d) Shackles. (4)

11. POLLUTION PREVENTION

DEC 2023/NOV 2023

3) With reference to MARPOL Annex 1 and the control of operational discharge into the sea of oil or oily mixtures from ships:

(a) State the criteria for discharging into the sea of oil or oily mixtures outside special areas. (7)

(b) State the criteria for discharging into the sea of oil or oily mixtures inside special areas. (7)

(c) State the criteria for discharging into the sea of oil or oily mixtures in the Antarctic area. (2)

DEC 2020/DEC 2019/MAY 2017

3)

(a) State FOUR conditions to be complied with in order that bilge water may be discharged overboard while the vessel is in a special area. (8)

(b) Describe an engine room bilge system that complies with current legislation. (8)

JULY 2019

3) With reference to the prevention of pollution at sea regulations, explain EACH of the following:

(a) Shipboard Oil Pollution Emergency Plans (SOPEP). (8)

(b) Oil Record Book. (8)

JULY 2018/JULY 2017

3) State the precautions to be taken against spillage during bunkering operations. (16)

12. REGULATIONS

MAY 2024/DEC 2021/MAY 2019

3)

(a) List the THREE types of Notice issued by the Maritime and Coastguard Agency (MCA) to disseminate information to ship-owners and seafarers. (6)

(b) Define the relevance and importance of each of the Notices stated in (a). (10)

OCT 2021/OCT 2023/OCT 2020

3) Outline the function of EACH of the following:

(a) International Maritime Organisation (IMO). (4)

(b) International Safety Management Code (ISMC). (6)

(c) Safety of Life at Sea (SOLAS). (6)

13. INSTRUMENTATION AND CONTROL

FEB 2024/DEC 2023/NOV 2023/FEB 2023/MAR 2018

4)

(a) With reference to a control system, list FOUR examples of a measured variable. (4)

(b) Explain the meaning of the term two-step control, giving one example of its use. (6)

(c) Explain the meaning of the term proportional control, giving one example of its use. (6)

OCT 2022/FEB 2020/JULY 2019

4) Describe, with the aid of a sketch, a method of remotely monitoring the contents of a fuel oil tank. (16)

JULY 2021/AUG 2020/OCT 2018/MAY 2017

4) Describe, with the aid of a sketch, a typical single element temperature control for a large lubricating oil system. (16)

14. STARTING AND CONTROL

FEB 2024

5) With reference to the main diesel engine starting airlines:

(a) Describe the main cause of starting airline explosion. (8)

(b) Explain how a leaking starting air valve can be identified while the engine is running. (4)

(c) State four different safety devices that can be incorporated into the starting line to limit the damage caused by an explosion. (4)

15. DUTIES AND WATCHKEEPING

MAY 2023/DEC 2018/OCT 2017/FEB 2017

4)

(a) Describe the actions that the EOOW should take to find that the temperature of the thrust block is rising above the normal, acceptable range. (8)

(b) Explain why the thrust block temperature is critical. (8)

FEB 2024/OCT 2023/FEB 2017

1) Describe the actions necessary to prepare the engine room for rough weather. (16)

DEC 2023/NOV 2023/DEC 2020/FEB 2019/MAY 2017

1) As the engineer officer of the watch list EIGHT reasons for calling the Chief Engineer Officer. (16)

OCT 2021/FEB 2018

1) Describe EIGHT actions to be taken by the relieving Engineer Officer of the Watch before taking charge of the watch. (16)

JULY 2021/MAY 2021

1)

(a) State FOUR documents which are found in the engine room, explaining the need for EACH. (8)

(b) State the procedure to be carried out if you found no one in the engine room when taking over a watch. (8)

DEC 2019

1) With reference to the testing of a ship's steering gear, prior to departure, list EIGHT items of machinery or control systems whose operation must be tested. (16)

JULY 2019/DEC 2018

1)

(a) State FOUR engine room records that are kept. (4)

(b) State why the records stated in Q(a) are important. (8)

(c) state the frequency of updating the stated in (a) (4)

OCT 2018/MAR 2017

1)

(a) Describe the immediate action that the Engineer Officer of the watch should take in the event of the engine room bilge rising faster than can be contained by the bilge pump. (10)

(b) State the features provided in the engine room pumping systems to deal with the situation in (a). (6)

MAY 2019

1) Describe the routine watch-keeping duties carried out in the steering flat. (16)

JULY 2018

1) Describe the procedures to be observed when taking over the responsibility for the engine room on a ship that is operating under Unmanned Machinery Space conditions. (16)

JULY 2017

1) List EIGHT actions to be taken by the Engineer Officer of the Watch to ensure the safe passage of the vessel through an area of heavy weather. (16)

FEB 2023/DEC 2021/MAR 2018

1) State EIGHT actions the Engineer Officer of the Watch would take on acknowledging unexpected high-level engine room bilge alarms in both port and starboard bilge wells. (16)

MAY 2023/OCT 2022/AUG 2020/OCT 2017

1) Outline a safe procedure for final daily watch-keeping checks of an engine room, which is designated UMS. (16)

MAR 2023/DEC 2022/DEC 2017

1) Describe the procedure for testing a steering gear within 12 hours of sailing. (16)