

Merchant Marine Academy of Macedonia
 School of Engineers
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Name:
 Student number:
 Exam paper grade:

FINAL EXAM

1. Fill in the gaps with a word from the list. There are two extra words. (15 p.)

*comply strainers non-return ballast homogenizer regulations return
 speed groups ejector anti-heeling incompatibility separator trim
 well sludge societies*

- All suction lines are fitted with _____ valves which do not allow the liquid to flow back to the bilge _____.
- A(n) _____ creates a vacuum by the _____ of the water flowing through it.
- According to MARPOL _____, bilge water must first pass through an oily water _____ before being discharged overboard.
- A(n) _____ is used to disperse any water and _____ which could remain in the fuel after centrifuging. It is also a good way to deal with _____ problems.
- During a(n) _____ operation at night, while at a shipyard in order to _____ the vessel for drydocking, it was discovered that the engine room was flooded.
- Governments and classification _____ have made up rules which have to _____ with international SOLAS rules.
- Bilge wells are always provided with _____ to prevent solid particles from entering and choking the bilge pump.
- A(n) _____ system is used to minimise the list of the vessel in port.

2. Supply the missing words. The first letter is given. (15 p.)

- The engine must be warmed up gradually by means of the circulating **p**_____.
- **D**_____ is related to fuel quality.
- The Calculated **C**_____ Aromaticity Index is used as an indication of the ignition quality of a fuel.
- **S**_____ may cause corrosion in the fuel system..
- Temperatures below the **p**_____ point of a fuel lead to wax formation.
- Present **p**_____ of propeller is 90 degrees.
- Do not exceed a **p**_____ of 4 bars.
- Present **r**_____ of the main engine are 100 per minute.
- When you turn the engine with the **t**_____ **gear**, the indicator cocks must be **o**_____.

3. Circle the correct choice. (9 p.)

- ___ are small particles of the catalyst used in the refining process.
 a. ash b. aluminium and silicon c. nickel
- Its compounds may corrode cylinder liners and piston rings.
 a. sulphur b. nickel c. iron
- ___ is a measure for the fluidity of a fuel at a certain temperature.
 a. pour point b. density c. kinematic viscosity
- ___ indicates the tendency of a fuel to form coke.
 a. acid number b. carbon residue c. cat fines
- The energy content of a fuel is stated in either calories or in ___ per unit weight.
 a. r.p.m. b. p.p.m. c. b.t.u.
- It is expressed in degrees centigrade; it must be known for safe transport and storage.
 a. pour point b. flash point c. dew point
- It detects all acids present and if it is increased, it may indicate other harmful substances.
 a. acid number b. base number c. cetane number
- Calcium, zinc and phosphorous are considered “fingerprint” ___ of used lubricating oils, and limits for these were set in ISO 8217:2010.
 a. elements b. particles c. acids
- ___ is used to indicate and assess the stability and cleanliness of a fuel.
 a. density b. total sediment potential c. carbon residue

4. Match the questions to the answers. There is an extra question. (10 p.)

- | | |
|---|---|
| 1. Which fuel property must you know to protect the vessel from fire? | -- Viscosity. |
| 2. What causes fouling of the gasways? | -- Special lubricants with high TBN. |
| 3. Which solid particles are particularly responsible for abrasive wear? | -- Ash. |
| 4. Which parameter is not actually a measurement of HFO quality? | -- The flash point. |
| 5. What do engines designed for operation on high sulphur fuels use to minimise the effects of sulphur? | -- By using a grinding tool. |
| 6. Which areas will suffer high wear if cat fines rates are not reduced? | -- Carbon residue. |
| 7. How can you remove cat fines? | -- Fuel pumps and injectors, the liners and piston rings. |
| 8. What can replace the traditional cylinder oil? | -- The pour point. |
| 9. How can you remove vanadium deposits from turbocharger nozzle ring? | -- Cat fines. |
| 10. Which fuel property determines the requirements | -- Blended lube oil. |

for tank heating and transferring?

11. Which parameter represents the incombustible components of fuel oil?

5. Complete the following sentences regarding what to do when a ship is about to arrive in port with appropriate verbs. (15 p.)

- I** _____ **m** Chief Engineer regarding arrival.
S _____ additional generator.
S _____ the steam turbine and shaft generator, if fitted.
E _____ **e** that power is available for deck machinery and bow thruster.
M _____ **e** a visual inspection of the steering gear room.
C _____ the dampers from exhaust gas boiler and open bypass.
S _____ **t** and lock sewage direct overboard discharge and start sewage plant or
o _____ valve for sewage holding tank.
C _____ over to high seas suction from low sea suction.
D _____ the air receivers.

6. Complete the sentences with an appropriate preposition. (12 p.)

- Fill _____ the tank to the alarm point.
 -- The temperature is too high, it is 20 degrees _____ normal.
 -- Ejectors are simple in design and reliable _____ operation and due _____ their excellent suction capability, they are frequently used _____ various marine applications.
 -- Have all the preparations been done prior _____ arrival in port?
 -- We have to transfer water _____ number 2 tank _____ number 4 tank.
 -- Decide whether the harbour manoeuvres should be carried out on diesel oil or _____ heavy fuel oil. Change-_____ must be executed one hour _____ the first manoeuvres are expected.
 -- Installation of homogenizers _____ the centrifuge is not advisable.

7. Complete the sentences with the correct form of the words in parentheses. (12 p.)

- Poor combustion can cause _____ (**accumulate**) of _____ (**viscosity**) residues in the scavenging air chambers.
 -- The _____ (**deep**) and the number of bilge wells depend on the ship's size, its capacity and the amount of bilge it generates.
 -- Check the _____ (**suitable**) of lub-oil in the sump tank and fill up with clean _____ (**lubricate**) oil.
 -- Have indicator cocks been checked for water or oil _____ (**leak**)?
 -- Water in the lube oil system can cause _____ (**corrode**) wear.
 -- The versatile _____ (**apply**) of marine water ejectors makes them an important part of a ship's engine _____ (**equip**).
 -- Small amounts of water can accumulate in the ship as a result of _____ (**condense**), leakages of pipes, washing or rain.
 -- One of the reasons for taking ballast on board is to improve _____ (**stable**) of the ship, or to control the list during _____ (**load**) and discharge.

8. Match the words from the list to their synonyms/definitions below. (12 p.)

saline, condensation, contaminate, accumulate, perforated, heeling, sounding, because of, alter, recommend, detachable, dismantle

- due to:
- with salt :
- the process of steam turning into liquid:
- with holes:
- take apart, disassemble:
- change:
- gradually increase in quantity over a period of time:
- the process for calculating the total quantity of fluid in a tank:
- suggest:
- list:
- pollute:
- moveable: