

**MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS**

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FINAL EXAM

1. Complete the text using the words given below. (15 p.)

four, twelve, sump, guides, crosshead, pressure, bearings, supply, cooler, autoclean, filters, piston, drains, lubricates, circulating

In the lubrication of ME with _____ LO, the oil is taken from the ME LO circulating tank through _____ by screw-type pumps. It passes through a _____ and _____ filters, and ends in the main engine at a pressure of about _____ bars. It lubricates the main crankshaft _____, the crankshaft and camshaft drive.

A separate _____ is led to the _____ by high _____ pumps at a pressure of about _____ bars. It _____ the crosshead and the _____. Some of the oil travels back through the piston rod and cools the _____.

The used oil _____ into the circulating tank or the _____ tank.

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

crownclearanceoverhauledcotton wasterodcracks carbon intervals

gaugedisposalstress tightnesssealed deflection manual scale clearances

-- The instructions are supplied in _____ and are kept by the Chief Engineer, but they are at the _____ of all engine room members.

-- The engine should be _____ and cleaned at regular _____.

-- Lubricating openings should be _____ off and cleaning should be done with cleaning cloths not _____.

-- The cylinder head should be checked at the combustion side for _____ or burning damage and for _____ deposits at the water spaces.

-- The piston and especially the piston _____ is exposed to high thermal _____ which may cause cracking.

-- Piston rings should be checked for _____ deposits in their grooves and for proper _____.

-- The cylinder liner should be _____ for wear.

-- _____ readings should be taken as per the constructor's recommendations to check the _____ of the crankshaft.

3. The following list of terms includes the most important parameters of fuel oils for diesel engines. Match the terms to the appropriate explanation. There are two extra terms.(10p.)

ash contentspecific gravitycetane numberhydrogen sulphideviscosity

water and sedimentheating valuedensitycarbon residueflash point

pour pointsulphur

- Content in water and solid particles. The higher it is, the more possible it is to cause erratic combustion and corrosion: _____
- The lowest temperature at which the fuel oil is observed to flow: _____
- An indication of the ignition quality of distillate fuels: _____
- The amount of heat given off on complete combustion of one pound of fuel: _____
- The temperature at which the fuel vapours ignite when exposed to a flame: _____
- The measure of the resistance of the fuel to movement. The higher it is, the more difficult it is for the fuel to flow: _____
- Chemical element which can be very injurious to engine parts during combustion because it changes into acid: _____
- Unburned carbon during combustion which can deposit on engine parts: _____
- Non-combustible solid material in the fuel which scratches the rubbing surfaces it comes in contact with: _____
- A measure of the density or weight of the fuel. It also serves as a rough check on viscosity, carbon content and other qualities: _____

4. Find the missing words. The first letter is given.(15 p.)

- What do marine fuels come from? From **c**_____oil.
- Through what process are they taken? Fractional **d**_____.
- How do we call the fuels that are refined petroleum products? **D**_____ fuels.
- What is the function of the settling tank?It allows water and thick **p**_____ to sink down.
- How do we call the fuels that come from the residues of petroleum distillation?**R**_____ fuels.
- What does the acronym CCAI stand for? Calculated **C**_____ **A**_____ Index.
- What does the booster pump do? It raises the **p**_____ of the fuel.
- What do you need before starting any overhauling? The instructions **m**_____ and some **s**_____ parts ready.

5. Complete the sentences with the correct form of the words in parentheses. (15 p.)

- The _____ (**clarify**) separates dirt from the fuel.
- _____ (**add**) inthe _____ (**lubricate**) oil improve its quality.
- _____ (**accumulate**) of deposits and/or excessive lubrication can cause sticking of piston rings in their grooves.
- The TBN value of a lube oil eliminates the _____ (**corrode**) influence of acids.

- Most fuel _____ (**inject**) are operated _____ (**hydraulic**).
- HFO is more _____ (**viscosity**) than DO and it needs _____ (**treat**).
- Chemical _____ (**stable**) is an important specification of lube oils.
- _____ (**sulphur**) acid causes _____ (**corrode**).
- The _____ (**centrifuge**) _____ (**separate**) separates water and _____ (**impure**) from the fuel.

6. Match the words to their definitions/explanations below. (12 p.)

centrifuge, scale, corrosion, dismantle, emission, defective, stalling, antifouling, deformation, align, friction, insulate

out of shape, distortion:

faulty:

bring to a straight line:

oxidation leading to rust:

fighting dirt:

rubbing between two metal surfaces:

reduction of revolutions, eventual stopping of the engine:

discharge of gases:

disperse through outward movement:

protect against heat dispersal:

deposits of salts:

disassemble:

7. Suggest the right additive for the following problems. You can choose from the following: (8 p.)

antioxidants, corrosion inhibitors, viscosity index improvers, wear preventers, pour point depressants, detergents, dispersants, antifoamants

Difficulty in flowing at lower temperatures: _____

Fouled surfaces: _____

Scratched cylinder liner surface: _____

Major accumulation of deposits on piston crown and cylinder liner: _____

Signs of corrosion on metal surfaces: _____

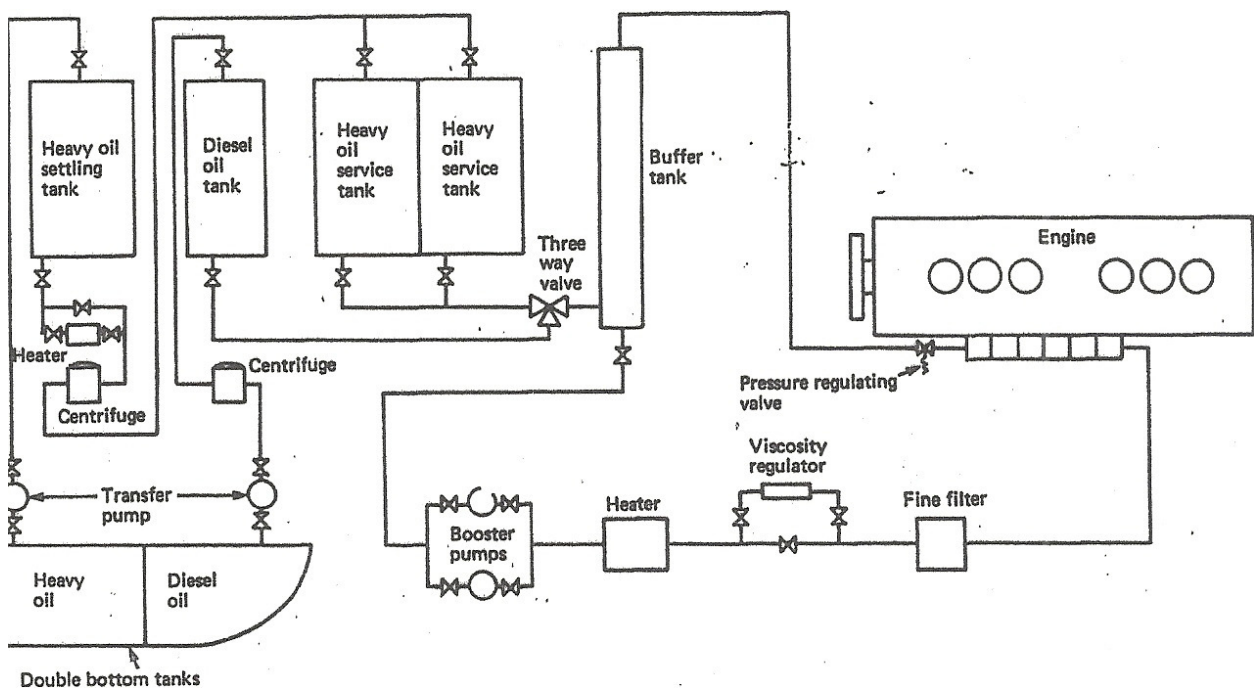
Foam in the crankcase: _____

Unstable viscosity: _____

Oxidation of oil: _____

8. Insert the appropriate word (or words) in the gaps to complete the text on a typical fuel oil system. (10 p.)

From the storage tank or (on older vessels) double bottom tanks, the HFO is pumped into the _____ tank, where water and heavy dirt sink down. Then it is fed through a _____ and next through a _____, where the oil is cleaned. Water and dirt go to the _____ tank. Then the clean oil is pumped into the HFO _____ tanks which are in duplicate, as one is in use, while the other is on standby. From there the oil, after passing through the _____ tank, is pumped by high pressure pumps into a _____ and right after into a _____, which automatically adjusts the temperature of the oil. Finally, the oil is discharged through a fine _____ to the main engine fuel pump suctions. A _____ valve allows us to operate the engine on diesel oil.



GOOD LUCK!!!