

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

Course: Maritime English

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Date:

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Exam paper grade:

FINAL EXAM

A. Fill in the gaps using the words below. (15 p.)

top-off hose sounding spillage drain off signals oil overflow

bunkering stored repairs connections valve untested flanges

Preventing oil spills

1. Know your ship. Where are the overflow and _____ pipes? Check that they are clearly marked especially after painting or _____. Remember that an “airbubble” can force _____ out of a goose-neck ventilator.

2. Plug scuppers. Plug scuppers when _____, loading or discharging oil. If there is heavy rain, then open one scupper, _____ the water and replug. Repeat if necessary.

3. Use serviceable equipment. Do not use _____ equipment; it may rupture or break. Cargo and bunker _____ pipes should be handled with care and _____ without bends that may fracture the hose.

4. Communications and identification. Agree clear _____ with terminal/bunkering station. Keep a watch on valves and _____. Frequently look over the side for traces of oil on the water. Make sure you open the correct _____. Always close a valve tight and check the position indicator.

5. Control pumping rate. Slow down the rate of oil being pumped and _____ tanks with extreme caution. Keep a careful watch on ventilators and _____ points.

6. Use drip trays. When hose _____ are being made, drip trays must be used to catch any _____. Blank the ends of hoses and ship connections.

B. Read the following passage on the properties of lube oils and underline the correct alternative. (10 p.)

The properties of lubricating oils are *similar to / different from* those of fuel oils. Viscosity is the *least / most* important property of lube oils. The Society of Automotive *Engines / Engineers* SAE has *classified / divided* oil viscosity from SAE 10 to SAE 250. SAE 10 to SAE 20 oils are very *thin / thick* and are suitable for *low / high* temperatures. SAE 30 to SAE 50 oils having a medium to high viscosity are *unsuitable / suitable* for diesel engines. The viscosity index, VI, of the oil is of equal

importance because it indicates how stable the oil is to variations of temperature. Chemical stability is an important specification of lube oil, too. The *acid / base* neutralising capacity of oil is represented by its total base number (TBN) value, which indicates the oil's *acid / alkaline* reserve. The *higher / lower* the TBN is, the more acidneutralising capacity the oil has.

C. Put the following vocabulary under the correct heading. (12 p.)

service tank pressure chambers specific gravity distillate CCA needle

purifier nozzle viscosity regulator balancing tank carbon content atomiser

Fuels & their properties Fuel oil system Fuel injector

D. Match the words to their definitions. (10 p.)

to insulate buffer tank sludge to settle down to centrifuge to boost

ullage to regulate to purify surplus

- balancing tank, mixing tank
- the distance from the surface of the oil in a tank to the top
- to increase, push up, enhance
- to disperse through outward movement
- excess
- to lag, protect against heat dispersal
- to control, adjust
- to remove impurities, clean
- mud, deposits of fuel
- to go down, sink

E. 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. (15 p.)

cetane number hydrogen sulphide viscosity pour point density

water and sediment heating value ash content specific gravity

sulphur carbon residue flash point

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

F. Complete the sentences with the appropriate form of the words in parentheses. (15 p.)

- Empty the _____ (**contain**) of this box on the floor.
- The HFO _____ (**purify**) separates water and _____ (**impure**) from the fuel.
- Chemical _____ (**stable**) is an important _____ (**specify**) of lubricating oils.
- _____ (**add**) in the lubricating oil improve its quality.
- The TBN value of a lube oil eliminates the _____ (**corrode**) influence of acid.
- Most fuel _____ (**inject**) are operated hydraulically.
- Highly _____ (**viscosity**) fuels need special treatment.
- _____ (**distil**) fuels have cleaner emissions than _____ (**residue**) fuels.
- The _____ (**remove**) of water and foreign particles in the lube oil is done in a centrifugal _____ (**separate**).
- Detailed _____ (**instruct**) on how to operate and maintain an engine are given by the engine constructors to ensure the efficient _____ (**operate**) of the machinery.

G. The following sentences describe the system and the circulation of lube oil. Put them in the correct order using the table below. (8 p.)

1. The oil is drawn from the sump tank by pressure pumps.
2. A parallel line distributes the oil to the cylinder for lubrication and cooling of the pistons. From there the used oil drains in the tank.
3. The oil is supplied to the engine at a pressure of about 4 bars.
4. It passes through a centrifugal separator, fine filters and a cooler before it enters the engine.
5. It lubricates the main crankshaft bearing first.
6. Finally, it is led up through the connecting rod to the gudgeon pin before returning to the crankcase.
7. Drillings in the crankshaft, then, take the oil to the crankpin or bottom end bearings.
8. In the sump tank there is a sounding pipe which serves as a vent, too. There is also a drain cock for the removal of water and dirt.

Correct order:

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H. Write a paragraph comparing HFO and MDO in relation to their use and properties. (15 p.)