

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

**Course: Maritime English**

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**Name:**

**Student number:**

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**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 “air-bubble” 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 or broken, drip trays must be used to catch any \_\_\_\_\_. Blank the ends of hoses and ship connections.

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

*service tank pressure chamber specific gravity distillate CCAI needle  
purifier nozzle viscosity regulator balancing tank carbon content atomiser*

Fuels & their properties	Fuel oil system	Fuel injector

**C. 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 acid neutralising capacity the oil has.

**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 go down, sink .....
- 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 .....

**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. (10 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 specification of \_\_\_\_\_ (**lubricate**) 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. (10 p.)**

**I. Do the following actions belong in the “Before bunkering”, “During bunkering” or “After bunkering” safety procedures? Write them in the appropriate spaces in the list that follows. (10 p.)**

- Reduce loading rate before topping off.
- Send bunker samples for analysis.
- Rig fire fighting equipment.
- Plug scuppers.
- Allow sufficient ullage to drain hoses and lines.
- Blank off hose before lifting it over the side.
- Mop up any drips and minor spills.
- Establish communications between ship and bunkering station/barge.
- Take periodic witnessed oil samples.
- Post “No smoking” and “No Naked Light” signs.

<b>Before bunkering</b>	<b>During bunkering</b>	<b>After bunkering</b>
<b>Actions:</b> -- Position drip trays and save-alls. -- Close scuttles, windows and air conditioning intakes. ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	<b>Actions:</b> -- Close valves as each tank is loaded. -- Notify bunker station/barge when final tank is being filled. ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	<b>Actions:</b> -- Close and blank off manifold. -- Unplug scuppers and open drains. -- Drain and stow drip trays. ..... ..... ..... ..... ..... ..... ..... ..... ..... .....

**GOOD LUCK!!!**