Merchant Marine Academy of Macedonia **NAME:**
School of Engineers **Student Number:**
Academic Year: 2014-2015
Semester: C' (Manila)
Instructors: A. Birbili, Dr E. Botonaki, Dr M. Tsompanoglou
Exam Period: September 2015

Final Test

A. Insert an appropriate word (or words) in the gaps to complete the text on a typical lube oil system. (10x1.5=15)

The oil is taken from the ME LO circulating tank through filters by screw-type _____. It passes through a _____ and an auto-clean filter and ends in the ME at a _____ of about four bars. It lubricates the main crankshaft _____, the crankshaft and the camshaft drive. A separate supply is led to the _____ by high-pressure pumps. Some of the oil travels back through the piston rod and cools the _____. The rest is led down a drilling in the connecting rod and lubricates the bottom end _____. This oil is also used to operate the hydraulic _____ valve and the hydraulic reversing gear of the engine. The used oil _____ into the sump tank. The oil is constantly centrifuged through a _____ to remove any water and foreign particles.

B. Fill in the gaps with the right word from the list. (10x1)

acid holder viscosity assembly exhaust combustion dirt ash sulphur injectors

--Heavy fuel oil produces sludge and dirty _____ gases, and contains more _____ than diesel.
--Because heavy fuel has a high _____ it cannot be pressed through _____ without pressure. It also needs purifying to remove water and _____.
--Sulphur can damage engine parts during _____ because it changes into _____.
--_____ scratches the rubbing surfaces it comes in contact with.
--The nozzle _____ is screwed at the bottom of the injection _____.

C. Fill in the gaps with a word from the list. (12x1)

hoses spillage stalling bunkering signals sounding
pollution friction injection spill ventilator drip-trays

--You have to know where the _____ pipes are on the ship.
--When there is an oil _____, oil booms are rigged around the vessel to restrict the extent of the _____.
--An "air-bubble" can force oil out of a goose-neck _____.
--Plug scuppers when _____ or discharging oil.
-- During bunkering, you should agree on clear _____ with the barge.
--_____ must be stored without bends.
-- A faulty _____ pump can be the reason behind a _____ engine.
--Place _____ under hose connections to catch any _____.
--Lubrication reduces _____.

D. Match the words to their definitions/synonyms. (13x1)

adjust adequate seal centrifuge refine increase
score task scale sink corrosion atomiser tapered

settle down _____
scratch _____
oxidation leading to rust _____
disperse through outward movement _____
opening through which fuel is sprayed _____
enough _____
duty _____
regulate _____
conical _____
deposits of salt _____
distil _____
close securely _____
boost _____

E. The following list of terms includes the most important parameters of fuel oils for diesel engines. Match the terms with the appropriate explanation. <u>There are two extra terms.</u> (10x1.5=15)

density carbon residue flash point pour point ash content sulphur specific gravity
cetane number hydrogen sulphide viscosity water and sediment heating value

-- The temperature at which the fuel vapours ignite when a flame is applied to it: _____
-- The measure of the resistance of the fuel to movement. The higher it is, the more difficult it is for the fuel to flow: _____
-- The lowest temperature at which the fuel oil is observed to flow: _____
-- An indication of the ignition quality of the fuel: _____
-- The amount of heat given off on complete combustion of one pound of fuel: _____
-- A measure of the density or weight of the fuel. It also serves as a rough check on viscosity, carbon content and other qualities: _____
-- Content in water and solid particles. The higher it is, the more possible it is to cause erratic combustion and corrosion: _____
-- 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: _____

F. Write the lube-oil additive that helps achieve the following: (5x1)

Keeps the engine parts clean: .....
Keeps sludge and dirt suspended in the oil: .....
Prevents the corrosion of metal surfaces: .....
Limits the wear caused by friction: .....
Lowers the freezing point of oil: .....

G. Complete the sentences with the correct form of the words in parentheses. (15x1)

--Empty the _____ (contain) of this box on the floor.
--Changes in temperature can cause _____ (deform) in metal parts.
--The _____ (clarify) separates dirt from the fuel.
--We must reduce the fuel _____ (consume).
--_____(distil) fuels have cleaner _____ (emit) than _____ (residue) fuels.
--Bunkering samples are sealed for later _____ (verify) of the supplied product quality.
--Engineers must follow the _____ (instruct) of the engine _____ (construct).
--There are problems with the _____ (lubricate) of the cylinder liner.
--Oxidation of the lube oil is prevented with certain _____ (add).
--This oil is too _____ (viscosity). It needs special_____ (treat).
--Fractional _____ (distil) is the process through which the products of crude oil are obtained.

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