

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

Course: Maritime English

Academic year: 2016 – 2017

Semester: C' (retakes-Manila)

Name:

Student number:

Instructors: A. Birbili, M. Tsompanoglou

Exam period: February 2017

Date:

Exam paper grade:

FINAL EXAM

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

corrosion sticking mineral friction metals wear heat consult

distillation performance running antifouling sealing coolant

inadequate

The main task of lubrication is to reduce _____ between the moving parts of an engine. In this way we ensure better _____ of the engine and reduction of _____ due to friction. Lubrication also acts as a _____ because it absorbs a considerable amount of _____ which is released from friction. Furthermore, it assists the piston rings in _____ the combustion chamber. Moreover, it protects the surfaces from _____, even when the engine is out of _____, thanks to the good tenacity lubricants have on _____. Finally, it keeps the metal surfaces clean due to the _____ property of lubricating oil. Correct lubrication of the engine is of great importance because _____ lubrication would lead to the seizing of bearings and _____ of the engine. The correct choice of lubricating oil is essential too, and we should always _____ the engine constructor's manual as to the recommended type of oil for the particular engine. The types of lubricating oils used in marine diesel engines are generally _____ oils, coming from the residues (base stock) of crude oil after its _____.

B. Write down the appropriate lube oil additive(s) which would help with the following problems. (10 p.)

- Fouled surfaces:
- Difficulty in pumping the lube oil at low temperatures:
- Major accumulation of deposits on piston crown and cylinder liner:
- Signs of corrosion on metal surfaces:
- Scored, scratched cylinder liner surface:

C. Match the words to their definitions. There is one extra word. (10 p.)

friction insulate erosion tenacity recondition antifouling

lap dismantle emission corrosion seizing

- oxidation leading to rust.....
- cover with, put on top of a surface.....
- fighting dirt.....
- rubbing between two metal surfaces.....
- major damage (of bearings, pistons) due to inadequate lubrication.....
- sticking property.....
- discharge of gases, smoke, etc.....
- protect against heat dispersal.....
- service, overhaul, bring in the former condition.....
- disassemble, disconnect, remove.....

D. 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: _____
- _____

E. State whether the following sentences are True or False. (10 p.)

- The higher the viscosity of a fuel oil, the more heating it needs to reduce it.
- Around the pour point the fuel can hardly be pumped and needs heating.

- The cylinder liner is lubricated ____.
- a. circumferentially b. horizontally c. vertically
- The crosshead and the guides are lubricated by ____ oil.
- a. cylinder b. circulating c. turbine
- The ____ the TBN is, the more acid neutralising capacity the oil has.
- a. lower b. better c. higher
- The piston ____ spread the cylinder oil up and down the surface of the liner.
- a. rod b. pin c. rings

G. Match the questions to the answers. There is an extra answer. (5 p.)

- | | |
|--|--|
| 1. Where are the fuels stored? | -- Intermediate fuel oil. |
| 2. How is the fuel cleaned? | -- It adjusts the temperature of the fuel. |
| 3. What do marine fuels come from? | -- Residual fuels. |
| 4. How do we call the fuels that are refined petroleum products? | -- MDO and HFO |
| 5. How do we call any fuel whose grade lies between HFO and MDO? | -- It raises the pressure of fuel. |
| 6. What is the function of the settling tank? | -- Crude oil. |
| 7. What does the viscosity regulator do? | -- By a centrifugal separator. |
| 8. What does the booster pump do? | -- It allows water and thick particles to sink down. |
| 9. What is the function of the buffer tank? | -- Distillate fuels. |
| 10. Which fuels are mainly used in marine diesel engines? | -- In the storage tanks. |
| | -- It allows the used oil from the engine to be mixed with a new charge. |

H. 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.

I. What maintenance work should be done to the following engine parts? Choose an appropriate answer from the ones in the box below. (10 p.)

- scored valve seats >.....
- seized piston >.....
- fuel cam nuts >.....
- stuffing box >.....
- noisy crosshead guides and slippers >.....
- sump tank >.....
- connecting rod screws >.....
- governor >.....

should be retightened	should be lapped with carborundum paste and reground	the guides should be aligned and the ply of slippers should be readjusted	replacement
should be cleaned of sediment	check the level and condition of oil	should be cleaned and its sealing elements (flange, gasket, packing) should be replaced	should be checked for correct tightness and retightened

GOOD LUCK!!!