MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English
Academic year: 2018 – 2019 **Exam period: February 2019**
Semester: C **Date: 14/2/19**
Name: **Exam paper grade:**
Student number:
Instructors: M. Tsompanoglou, A. Birbili

FINAL EXAM (RETAKES)

1. Complete the text using the following words. (15 p.)

wear, heat, consult, distillation, performance, running, antifouling, sealing, coolant, corrosion, mineral, friction, metals, sticking, 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 of crude oil after its _____.

2. Fill in the gaps using the words below. There are two extra words. (15 p.)

fortified, erratic, acid, drillings, mixing, injection, assembly, sufficient, needle, transition, injurious, capacity, holder, insufficient, alkaline, atomizers, grooves

- -Each service tank has the _____ to provide the engine with fuel for 24 hours.
- -Lube oils are _____ with chemicals.
-- _____ in the crankshaft take the oil to the crankpin and bottom end bearings.
-- The _____ stem and its return spring of the fuel injector are fitted in the injector _____.
-- The nozzle _____ has one or more _____ through which the fuel is sprayed into the combustion chamber.

-- The total base number (TBN) value of a specific oil indicates its _____ reserve.
-- Sulphur can be very _____ to engine parts during combustion, because it changes into _____.
-- High water content in fuel causes _____ combustion and corrosion.
-- Incorrect _____ timing can cause lack of power or can cause the engine to produce white smoke, as there is _____ temperature to properly burn the fuel.
-- In some cases, a _____ tank is used for the gradual _____ from HFO to MDO.

3. Match the following list of lub-oil additives to their functions. (8 p.)

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

Keep sludge, carbon and other deposits suspended in the oil:
Increase the VI of the oil:
Limit the damage that is caused by friction:
Reduce foam in the crankacase:
Keep the engine parts clean of deposits:
Lower the freezing point of oil:
Prevent the oxidation of oil:
Prevent the corrosion of metal surfaces:

4. 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 ash content specific gravity water and sediment heating value density carbon residue flash point pour point sulphur

-- 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 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: _____
-- 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: _____

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

dismantle, emissions, defective, stalling, antifouling, adequate,

sludge, friction, centrifuge, scale, corrosion, purify

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:
remove impurities, clean:
deposits of salts:
disassemble:
enough:
faulty:
mud, dirt:

6. Complete the sentences with the correct form of the words in parentheses. 10p.

-- The HFO _____ **(purify)** separates water and _____ **(impure)** from the fuel.
-- _____ **(add)** in the _____ **(lubricate)** oil improve its quality.
-- _____ **(sulphur)** acid is very _____ **(corrosion).**
-- This is an engine of high _____ **(efficient).**
-- This oil is too _____**(viscosity).** We should make it thinner by heating.
-- Most fuel _____ **(inject)** are operated hydraulically.
-- The _____ **(remove)** of air from the cylinders is done with the help of air cocks.
-- Chemical _____ **(stable)** is an important specification of lubricating oils.

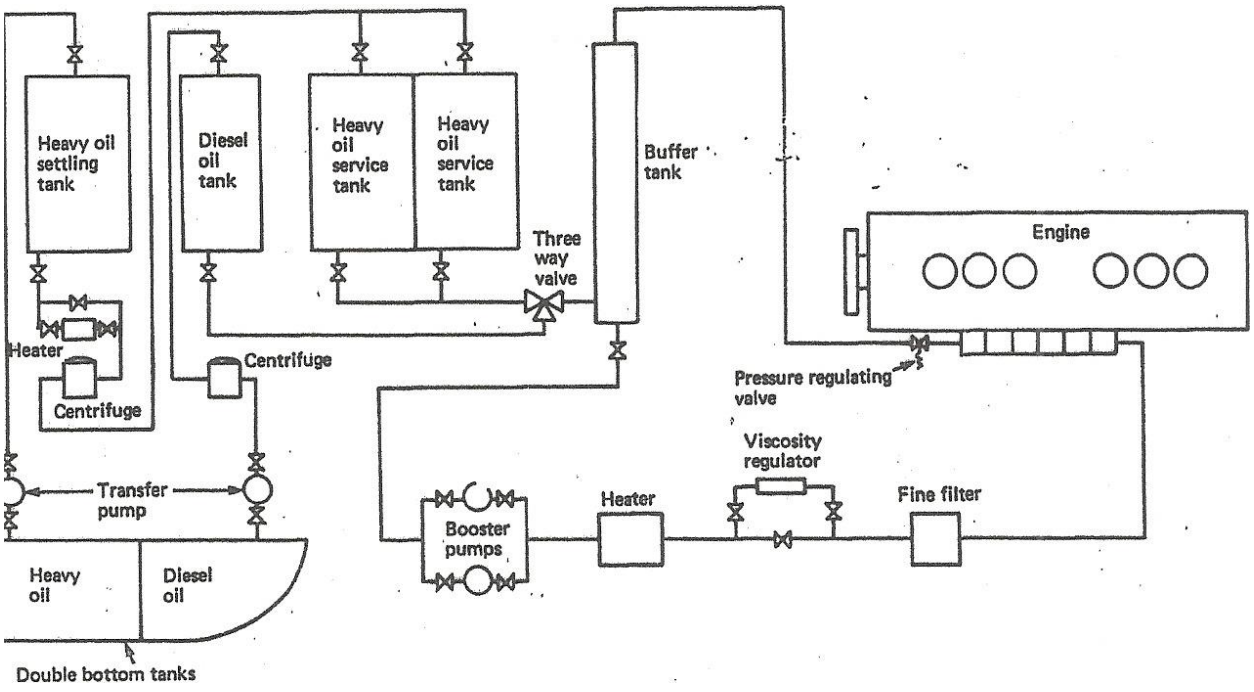
7. Read the following passage on the properties of lube oils and underline the correct alternative. (10 p.)

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.

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, 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.



9. Write a paragraph comparing HFO and MDO in relation to their use and properties. (10 p.)