

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

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

illuminated needle notify sulphur calcium SOPEP bunkering

clearances carbon incident flammable ash rupture affect

plug injector distillation

- _____ the Officer of the Watch when a failure of machinery has occurred which may _____ navigation.
- Keep the E/R properly _____ at all times.
- When an oil pollution _____ occurs, the ship follows the _____ in accordance with the requirements of MARPOL.
- Do not use untested equipment; it may _____ or break.
- The _____ stem and its return spring of a fuel _____ are fitted in the injector holder.
- Corrosion is caused by the presence of _____ in the fuel.
- Do not leave _____ material in buckets or open containers; it may cause fires.
- Marine _____ is the supply of fuel oil for ships.
- _____ scuppers when loading or discharging oil.
- The process through which marine fuels are obtained is called fractional _____.
- The acronym CCAI stands for Calculated _____ Aromaticity Index.
- Piston rings should be checked for proper _____ in order to avoid wear and breakage.

B. Fill in the blanks with the following words. (10 p.)

high grooves film lubricators return rings

neutralises fuel wear storage

The lubrication of the cylinder is very important, first because it forms an oil _____ between piston rings and cylinder liner, thus reducing friction, and secondly because it _____ the acid products of combustion and reduces cylinder _____ considerably. The cylinder oil has _____ viscosity and a high TBN value. It is drawn from the cylinder oil _____ tank to a small service tank by separate pumps. From there, the oil is supplied to _____ by gravity and is led through drillings onto the liner surface where

_____ distribute it circumferentially around the liner, and the piston
_____ spread it up and down the surface of the liner. There is not
_____ of the used oil because it is finally burnt with the
_____.

C. Write down the appropriate lubricant additives which would help with the problem. (10 p.)

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

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

stalling (of engine) neutralise scale emission distilled
ullage accumulate purify scuffed sludge

- build up
- deposits of salt
- pitted, with deep scratches
- the distance from the surface of the oil in a tank to the top
- discharge of gases, smoke, etc.
- reduction of revolutions, eventual stopping
- mud, deposits of fuel
- remove impurities, clean
- refined
- make ineffective, with no result

E. What do the following words mean? Underline the correct choice. (5 p.)

1. to countersign: to **add/delete/deny** one's signature to a document
2. to crosscheck (of results): to **confirm/cross out/witness** the results by using an alternative way of checking
3. to verify: to prove that smth is **false/true/incomplete**
4. to retain (of pressure): to **maintain/reduce/adjust**
5. to sound (of a tank): to **measure/check/examine** the depth

F. The following list of terms includes the most important parameters of fuel oils for diesel engines. Match the terms with the appropriate explanation. There are two extra terms. (15 p.)

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

- 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: _____
- 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: _____

G. Insert an appropriate derivative of the words in the parentheses. (15 p.)

- High water _____ (**contain**) in the fuel causes _____ (**error**) combustion and _____ (**corrode**) to injectors.
- Samples are sealed for later _____ (**verify**) of supplied product quality in case a dispute arises.
- Highly _____ (**viscosity**) fuels need special _____ (**treat**).
- _____ (**distil**) fuels have cleaner emissions than _____ (**residue**) fuels.
- Chemical _____ (**stable**) is an important _____ (**specify**) of lubricating oils.
- Two crew members were injured in a _____ (**collide**) in the North Sea last week.
- The HFO _____ (**purify**) separates water and _____ (**impure**) from the fuel.
- Most fuel injectors are operated _____ (**hydraulic**).
- On _____ (**complete**) of refueling, you should close all filling valves.

H. Put the verbs into the 'Simple Past' or the 'Present Perfect'. (10 p.)

- There (be) _____ a lot of seagulls in the sky yesterday and one bird (fly) _____ into the funnel.
- I was very tired so I (go) _____ to bed early.
- I couldn't afford to keep my car, so I (sell) _____ it.
- _____ (the ratings/practise) the fire drill yet?
- The bed was very uncomfortable. I (not/sleep) _____ very well.
- An A/B (fall) _____ down the ladder and (break) _____ his leg yesterday morning.
- The Chief Officer (forget) _____ to send the fax to the company.
- We (not/read) _____ the safety manual yet.

I. Answer one (1) of the following questions. (10 p.)

1. What are the objectives of lubrication?
2. What does the fuel injector do? Why is it very important?

GOOD LUCK!!!