

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

**Course: Maritime English**

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**FINAL EXAM**

**A. Provide the right derivative of the word in the parentheses. (15 p.)**

- \_\_\_\_\_ (**align**) may cause cylinder oil film deficiencies.
- To prevent cold corrosion, one \_\_\_\_\_ (**solve**) is to insulate the outside of the liner so that there is a \_\_\_\_\_ (**reduce**) in the cooling effect.
- \_\_\_\_\_ (**catalyst**) fines often cause \_\_\_\_\_ (**abrade**) wear.
- \_\_\_\_\_ (**sulphur**) acid is formed due to absorption of \_\_\_\_\_ (**condense**) or moisture present in the combustion chamber.
- Proper \_\_\_\_\_ (**refrigerate**) prevents the \_\_\_\_\_ (**oxide**) of the cargo.
- The systematic variation in \_\_\_\_\_ (**alkaline**) may cause uneven \_\_\_\_\_ (**corrode**) wear on the cylinder liner.
- The \_\_\_\_\_ (**evaporate**) unit acts as a heat exchanger by transferring heat to the \_\_\_\_\_ (**refrigerate**).
- Although Calcium Silicate (CalSil) is a good \_\_\_\_\_ (**insulate**), it should not be used in high \_\_\_\_\_ (**vibrate**) environments, as it tends to break up.

**B. Put an appropriate word from the list in the gaps that follow. There are two extra words. (15 p.)**

*localised pressures gauged frictional alloy particles rate surface dew point  
slow steaming modified comply scuffing temperatures pour point bore abrasion*

- The liner has to be replaced when the wear is over 0.8% of the \_\_\_\_\_ diameter.
- To \_\_\_\_\_ with the Tier II NOx regulations, engine cylinders must operate under increased \_\_\_\_\_ and reduced operating \_\_\_\_\_.
- \_\_\_\_\_ is due to insufficient lubrication, which results in \_\_\_\_\_ welding between points on the piston rings and the liner \_\_\_\_\_ with subsequent tearing of microscopic \_\_\_\_\_.
- Wear \_\_\_\_\_ is a measurement of the speed at which wear happens. The liner is \_\_\_\_\_ at regular intervals to calculate this speed.
- Cylinder liners are fabricated from a cast iron \_\_\_\_\_.
- Temperatures below the \_\_\_\_\_ allow steam to condense.
- \_\_\_\_\_ wear takes place between the cylinder liner and piston rings.
- Some older engines are \_\_\_\_\_ for low-load operation known as “\_\_\_\_\_”, where vessels may operate as low as 10% load.

**C. IMO SMCP: Handling liquid goods, bunkers and ballast pollution prevention.**

**Fill in the missing words in the following questions. (10 p.)**

*connect operational maximum washing stripping  
disconnected inerted receiving available pressure*

- What is the \_\_\_\_\_ loading rate?
- Are your tanks \_\_\_\_\_?
- What is the pumping \_\_\_\_\_?
- What is the backpressure for \_\_\_\_\_?
- Is the Oil Pollution Prevention Plan \_\_\_\_\_?
- When will crude oil \_\_\_\_\_ start?
- Can we \_\_\_\_\_ the loading arm?
- Is the inert gas system \_\_\_\_\_?
- Are the cargo hoses \_\_\_\_\_?
- Are you \_\_\_\_\_?

**D. Choose the correct answer. (15 p.)**

- Diesel engine lube oil diluted with diesel fuel oil is indicated by \_\_\_\_  
a. decreased viscosity                      b. decreased pour point                      c. increased flash point  
d. increased viscosity
  
- If the analysis of used lube oil indicates a high content of iron particles, this could indicate \_\_\_\_  
a. excessive ring and liner wear                      b. excessive cooling of lubricating oil  
c. corrosive deterioration of a bearing                      d. inadequate air filtration
  
- “Loop”, “uniflow”, “cross flow” are terms used to describe various types of \_\_\_\_  
a. scavenging    b. turbochargers    c. control air circuits    d. supercharging
  
- The possibility of damage from operating a diesel engine at critical speeds is reduced by the use of \_\_\_\_  
a. a vibration damper    b. an isochronous governor    c. elastic engine mounts  
d. a cast iron bedplate with good flexible qualities
  
- What occurs in the combustion space of a diesel engine cylinder shortly after ignition and before the piston reaches TDC?  
a. rapid increase in pressure and temperature  
b. rapid increase in volume and decrease in pressure  
c. rapid increase in temperature with constant pressure  
d. rapid increase in pressure with constant temperature
  
- Which of the following operations will have a direct impact on the rate of wear in a cylinder liner?  
a. temperature of the scavenging air                      b. compression ratio of the piston  
c. quality of fuel injected                      d. amount of scavenge air in the cylinder
  
- Whether using a centrifuge or a simple filter, oil cleaning and filtration will be the most effective when the oil is at a \_\_\_\_  
a. low temperature and a high viscosity                      b. low temperature and a low viscosity  
c. high temperature and a high viscosity                      d. high temperature and a low viscosity
  
- In a diesel engine, the function of lubricating oil is to \_\_\_\_

- a. provide a film between the shafts and bearings
- b. cool the pistons and bearings
- c. remove metal or dirt particles resulting from wear
- d. all of the above

-- A diesel engine is supercharged in order to \_\_\_\_

- a. increase the no-load rpm's
- b. provide more fuel for combining with the air
- c. lower the no-load rpm's
- d. provide more air for combining with the fuel

-- Combustion knock will most likely occur as a result of using a fuel with \_\_\_\_

- a. low ignition quality
- b. high volatility
- c. low ignition delay
- d. a high cetane number

-- A diesel engine which is rated for normal operation at a crankshaft speed of 800 rpm is commonly classed as \_\_\_\_

- a. slow-speed
- b. medium-speed
- c. high-speed
- d. constant-speed

-- A centrifuge will satisfactorily remove \_\_\_\_ from fuel oil.

- a. gasoline
- b. water
- c. lube oil
- d. sulphur compounds

-- A scored diesel engine cylinder liner will cause \_\_\_\_

- a. rapid wear of piston rings
- b. combustion gases in the cooling water
- c. high firing pressure
- d. abnormally high cooling water temperature

-- Burning fuel with a high sulphur content in a diesel engine will \_\_\_\_

- a. cause clogging of the fuel system
- b. increase thermal efficiency
- c. increase the ability of the engine to start in cold weather
- d. produce corrosion in the cylinder and exhaust systems at low loads

-- Combustion knock can occur in the cylinders of a diesel engine under any condition permitting \_\_\_\_

- a. a shortened ignition delay period
- b. a lean fuel/air mixture
- c. excess fuel in the combustion chamber
- d. rapid vaporisation of injected fuel droplets

**E. Match the words from the list to their synonyms/definitions below. There is one extra word. (10 p.)**

*sluggishness alloy dilute faltering implement stalling  
orifice gauge cladding perishable composite*

- likely to decay or go bad quickly.....
- slow motion, idleness.....
- apply, put into force.....
- measure the dimension of the liner with an instrument.....
- made up of several parts or elements.....
- opening, aperture.....
- irregular running of the engine.....
- make a liquid thinner by adding water or other solvent.....
- a covering of hard material, used as protection.....
- metal consisting of two or more different metals mixed together.....

**F. Complete the following sentences with an appropriate word. (15 p.)**

-- The **c** \_\_\_\_\_ is used to cool down the refrigerant in the system,

- The **b** \_\_\_\_\_ of a diesel engine cylinder describes the inside diameter of the cylinder.
- An **e** \_\_\_\_\_ valve regulates the refrigerants to maintain the correct hold or room **t** \_\_\_\_\_.
- In order to fight **c** \_\_\_\_\_ corrosion, you must identify the best lube oil and **f** \_\_\_\_\_ rate.
- Onboard cylinder oil analysis tests the following two key parameters: **i** \_\_\_\_\_ content and **B** \_\_\_\_\_ Number.
- **S** \_\_\_\_\_ is the process of supplying a diesel engine cylinder with air at a pressure greater than atmospheric.
- The **c** \_\_\_\_\_ number of a diesel oil indicates its ignition quality.

**G. Complete the sentences with an appropriate preposition. There are 2 extra prepositions. You can choose from the following: (10 p.)**

*in, at, on, to, out, with, before, between, by, below, up*

- Treat spill \_\_\_\_\_ dispersants.
- The liner has to be cleaned and inspected \_\_\_\_\_ gauging.
- Spill waste has been contained \_\_\_\_\_ save-alls.
- You have to keep contact \_\_\_\_\_ the oil terminal \_\_\_\_\_ VHF Ch.14.
- There is leak \_\_\_\_\_ manifold connection.
- When the engine runs unevenly and will not pick \_\_\_\_\_ rpm, we have a serious problem.
- HFO has to be heated prior \_\_\_\_\_ centrifuging.
- Excessive liner wear will cause increased blow-\_\_\_\_\_.
- Pump \_\_\_\_\_ ballast tank No 2.

**H. Read the following article and answer the questions that follow. (10 p.)**

**ExxonMobil has issued fuel-switching tips for vessels entering and leaving ECAs**

ExxonMobil has compiled five ‘top tips’ to help vessel operators switch fuels effectively when entering and leaving emission control areas (ECAs) without introducing maintenance problems.

Typically, inadequate management of the fuel switch-over process can increase the risk of thermal shock to engine components, which can result in fuel pump seizures and engine shut-downs.

ExxonMobil advises marine operators to consider the following key tips:

- Have a clear switch-over procedure. It is important to ensure that the crew is familiar with the process. As an additional safety measure, the procedure should be tested prior to entering crowded and restricted channels where there is a higher risk of grounding or collision.
- Outline the best time to switch over. The optimal switch-over period is different for each vessel and operators must allow sufficient time for the fuel system to be flushed of all non-compliant fuel before arriving at an ECA limit.

- Avoid hazards; know the correct temperature and viscosity. The viscosity of heavy fuel oil (HFO), ECA fuels and marine gas oil (MGO) are very different. The appropriate temperature must be achieved to ensure that the optimum viscosity at the injectors is reached. HFO is injected at ~130°C and MGO needs to be cooled to ~30°C in order to reach the correct viscosity. Major engine manufacturers typically recommend a maximum temperature change of 2°C per minute to help avoid thermal shock.
- Understand compatibility. There is a risk of fuel incompatibility during the switching process where fuels may mix. This may clog filters, causing engine starvation and possible shut-down. In order to understand if fuels are compatible, an industry-standard spot test can be carried out on board or a more thorough compatibility test can be requested from a reputable testing laboratory.
- Choose the correct lubricant. Cylinder oils need to be sufficiently alkaline to neutralise any corrosive acidic sulphur in the fuel. However, when less sulphur is present, less sulphuric acid is produced. Too much alkalinity in the cylinder oil can lead to liner wear, while too little increases the risk of acid corrosion. When burning low sulphur fuels in slow speed engines, it is recommended that a lower base number (BN) lubricant be used.

(Retrieved: 23 June, 2016 from [www.mpropulsion.com](http://www.mpropulsion.com))

1. What problems can arise if the fuel switch-over process is not carried out adequately?
2. Why should the crew know the correct temperature and viscosity of the different fuels?
3. What problems can be caused due to fuel incompatibility?
4. How can one check if fuels are compatible?
5. Why is it of paramount importance to choose the correct lubricant?

**GOOD LUCK!!!**