MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English
Academic year: 2018 – 2019 **Name:**
Exam period: September 2019 **Student number:**
Semester: ST' **Date: 11/09/2019**
Instructors: A. Birbili, M. Tsompanoglou **Exam paper grade:**

FINAL EXAM

1. Complete the sentences with the correct form of the words in parentheses. (20 p.)

-- _____ **(sulphur)** acid is formed due to the _____ **(absorb)** of condensate or moisture which are present in the combustion chamber.
-- _____ **(pure)** in the fuel oil may cause scratches.
-- The rapid _____ **(grow)** of piracy attacks in Somali waters is connected to political _____ **(stable)** in the area.
-- Heat _____ **(lose)** may be reduced considerably with proper _____ **(insulate)**.
-- Micro-seizure marks run _____ **(axis)** on the liner surface and result from bad/poor lubrication, _____ **(sufficiency)** viscosity of lube oil, or _____ **(exceed)** loading.
-- 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.
-- The systematic variation in _____ **(alkaline)** may cause uneven _____ **(corrode)** wear on the cylinder liner.
-- _____ **(proper)** refrigeration can lead to the _____ **(oxide)** of temperature sensitive cargo.
-- Different solenoid valves control the flow of the _____ **(refrigerate)** into the cargo hold.
-- The cetane number of a diesel fuel indicates its _____ **(ignite)** quality.

2. Complete the following sentences with an appropriate word. The first letter is given. (15 p.)

-- Cylinder liner wear due to **f** _____ takes place between the cylinder liner and piston rings.
-- The bore of a diesel engine cylinder describes the inside **d** _____ of the cylinder.
-- Wear **r** _____ is a measurement of the speed at which wear happens.
-- The evaporator unit acts as a heat **e** _____ to cool down the cargo hold.
-- **C**_____ is the most effective way of removing water and dirty particles from fuels.
-- **S**_____ is the process of supplying a diesel engine cylinder with air at a pressure greater than atmospheric.
-- A reciprocating single-stage or two-stage **c** _____ is one of the components of a refrigeration system.
-- Onboard cylinder oil analysis tests the following two key parameters: **i** _____ content and **B** _____ Number.
-- A torsional vibration **d** _____ is installed on a diesel engine to isolate some of the crankshaft vibrations.

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

condition *outlawing* *modified* *ingress* *slow steaming* *temperatures* *pour point* *cold* *circuits*

charge *substitutes* *comply* *alterations* *implemented* *alternative* *dew point* *pressures*

-- Temperatures below the _____ allow steam to condense.
-- Cylinder liner wear can be minimised by avoiding any _____ of moisture from the _____ air.
-- To _____ with the Tier II NOx regulations, engine cylinders must operate under increased _____ and reduced operating _____.
-- Since the _____ of asbestos, _____ insulation materials had to be found and adopted as _____.
-- A _____-monitoring programme should be _____ in order to face the issue of _____ corrosion.
-- Some older engines are _____ for low-load operation known as "_____", where vessels may operate as low as 10% load.
-- The control unit consists of different safety and operating _____ for the safe operation of the reefer plant.

4. 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

-- A viscous damper is a sealed precision-built device which dampens the torsional vibrations in the:
a. camshaft b. thrust shaft c. flywheel d. crankshaft

-- A diesel engine is supercharged in order to:
a. increase the noload rpms b. provide more fuel for combining with the air
c. lower the noload rpms 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

-- In a diesel engine, pistons are connected to the crankshaft with:
a. piston guides b. connecting rods c. lash adjusters d. piston rods

-- 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. cause corrosion in the cylinder and exhaust systems at low loads

5. Match the words from the list to their synonyms/definitions below. There is one extra word. (5 p.)

sluggishness defective dilute faltering downtime stalling gauge volatility cladding confines splinter

-- time during which a machine is out of order.....
-- the boundaries of a place which restrict freedom of movement.....
-- slow motion, idleness……
-- the property of changing readily from liquid to vapour/gas.....
-- make a liquid thinner by adding water or other solvent……
-- a covering of hard material, used as protection…….
-- break into small, sharp pieces…….....
-- measure the dimension of the liner with an instrument.....
-- irregular running of the engine……..
-- faulty.....

6. Complete the sentences with an appropriate preposition from the list below. There are 2 extra prepositions. Some prepositions can be used more than once.
You can choose from the following: (10 p.)

in, at, on, to, out, with, before, by, up

-- Even engines operating _____ low sulphur fuels may be prone _____ scuffing damage.
-- High liner wear will cause increased blow-_____.
-- Spillage stopped and cleaned _____.
-- You have to keep contact _____ the oil terminal _____ VHF Ch.14.
-- The liner should be gauged _____ regular intervals.
-- HFO has to be heated prior _____ centrifuging.
-- The liner has to be cleaned and inspected _____ gauging.
-- Permanent insulation is cut and fitted _____ site.

7. 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 _____?

8. You will read an article about safe fuel changeover. Ten phrases have been extracted from the article. Write the correct number in front of the phrases. (10 p.)

---sufficient time for the fuel system to be flushed

---sufficiently alkaline

---when fuels may mix

---when entering and leaving

---ensure that the optimum viscosity

---a lower base number (BN)

---temperature change of 2°C per minute

---of grounding or collision

---can be carried out on board

---of thermal shock to engine components

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 **... [1]...** emission control areas (ECAs) without introducing maintenance problems.

Typically, inadequate management of the fuel switch-over process can increase the risk **...[2]...**, 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 **...[3]...**
- Outline the best time to switch over. The optimal switch-over period is different for each vessel and operators must allow **...[4]...** 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 **...[5]...** 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 **...[6]...** to help avoid thermal shock.
- Understand compatibility. There is a risk of fuel incompatibility during the switching process **...[7]...**. This may clog filters, causing engine starvation and possible shut-down. In order to understand if fuels are compatible, an industry-standard spot test **...[8]...** or a more thorough compatibility test can be requested from a reputable testing laboratory.
- Choose the correct lubricant. Cylinder oils need to be **...[9]...** 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 **...[10]...** lubricant should be used.

(Retrieved: 23 June, 2016 from www.mpropulsion.com)

GOOD LUCK!!!