MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English
Academic year: 2019 – 2020 **Name:**
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Instructors: A. Birbili, M. Tsompanoglou **Exam paper grade:**

FINAL EXAM

A. Put an appropriate word from the list in the gaps that follow. There are two (2) extra words. (15 p.)

lubricating pressures modified ingress cast low high clover dew point

slow steaming bore comply treating temperatures feed inner pour point

-- In order to fight _____ temperature corrosion, you must identify the best lube oil and _____ rate.
-- Some older engines are _____ for low-load operation known as "_____".
-- To _____ with the Tier II NOx regulations, engine cylinders must operate under increased _____ and reduced operating _____.
-- Temperatures below the _____ allow steam to condense.
-- Cylinder liners are fabricated from a _____ iron alloy.
-- _____ leafing, which is a form of cylinder liner wear, takes place between each pair of _____ quills.
-- The _____ of a diesel engine cylinder describes the _____ diameter of the cylinder.
-- Cylinder liner wear can be minimised by avoiding any _____ of water inside the liner by properly _____ the fuel oil.

B. Provide the right derivative of the words in the parentheses. (15 p.)

-- Scuffing is generally caused by _____ **(sufficient)** lubrication due to which large amount of heat is produced and microscopic _____ **(weld)** of piston rings and liner surface takes place.
-- An _____ **(expand)** valve regulates the refrigerants to maintain the correct room temperature.
-- _____ **(formation)** of piston rings during fitting may cause cylinder oil film deficiencies.
-- The systematic variation in _____ **(alkaline)** may produce uneven _____ **(corrode)** wear on the cylinder liner.
-- _____ **(sulphur)** acid is formed due to the _____ **(absorb)** of condensate or moisture present in the combustion chamber.
-- _____ **(abrade)** wear is sometimes caused by _____ **(catalyst)** fines.
-- To prevent cold corrosion, one _____ **(solve)** is to insulate the outside of the liner so that there is a _____ **(reduce)** in the cooling effect.
--In reefer ships, the temperature of the _____ **(perish)** cargo is controlled by the _____ **(refrigerate)** plant.
-- _____ **(friction)** wear takes place between the cylinder liner and piston rings

C. IMO SMCP: Handling liquid goods, bunkers and ballast pollution prevention.
Fill in the missing words in the following questions. (5 p.)

rate tanks pumping backpressure pollution
crude arm inert hoses receiving

-- Can we connect the loading _____?
-- What is the _____ pressure?
-- Is the Oil _____ Prevention Plan available?
-- What is the maximum loading _____?
-- When will _____ oil washing start?
-- Is the _____ gas system operational?
-- What is the_____ for stripping?
-- Are the cargo _____ disconnected?
-- Are you _____?
-- Are your _____ inerted?

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

-- 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

-- 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

-- 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

-- 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

-- 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

-- A diesel engine is supercharged in order to ___
a. increase the noload rpm b. provide more fuel for combining with the air
c. lower the noload rpm 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 (1) extra word. (10 p.)

fabricated downtime outlawing faltering implement stalling defective neutralise cladding fouled orifice

-- apply, put into force…….
-- make ineffective, with no result……
-- opening, aperture.....……..
-- faulty.....…….
-- irregular running of the engine……..
-- making something illegal and unacceptable.....……
-- a covering of hard material, used as protection…….
-- time during which a machine is out of order .....…….
-- dirty……..
-- manufactured…….....

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

--Different **s**_____ valves control the flow of the refrigerant into the cargo **h**_____.
-- The **c**_____ is used to cool down the refrigerant in the system.
-- The cetane index of a diesel oil indicates its **i**_____ quality.
-- **S**_____ is the process of supplying a diesel engine cylinder with air at a **p**_____ greater than atmospheric.
-- Onboard cylinder oil analysis tests the following two key parameters: **i** _____ content and **B**_____ Number.
-- The **d**_____, which is connected in the refrigeration system, consists of silica gel to remove any moisture from the refrigerant.
-- Whenever two surfaces slide over each other, **f**_____ is produced which leads to wearing down of both surfaces.

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

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

-- Stand _____ oil clearance team and report.
-- You have to dispose the sludge _____ the sludge tank.
-- The spillage has been stopped and cleaned _____.
-- You have to keep contact _____ the oil terminal _____ VHF Ch.14.
-- When the engine runs unevenly and will not pick _____ rpm, the fuel filter may be blocked.
-- There is leak _____ manifold connection.
-- HFO has to be heated prior _____ centrifuging.
-- Excessive liner wear will cause increased blow-_____.
-- Treat oil spill _____ dispersants.

H. Read the following article and answer the questions that follow. (15 p.)

Some engine surfaces on board a vessel can heat up to more than 600 degrees Celsius. That is, if you don't protect them. With the right equipment, however, the engine room is a safe place to work.

The sailor's profession used to be a hazardous one. Thousands of wrecks scattered all around the seabed of our oceans testify that in the old days, sailors who ventured out to sea did not always return. Luckily today seafarers can go to work and rely on returning home. But that doesn't mean you can overlook safety issues. These days, a fire in the engine room is the most serious safety risk.

"'What if there is a fire in the engine room?' is a question that pops into the mind of anyone who ever gets to work down there," says Jyrki Salo.

Salo worked as a marine engineer for over seven years. These days he's stationed on land in Wärtsilä Services' Turku office in Finland, where he's the Product Manager for large bore and 4-stroke solutions.

Every second counts.

Things get hot in an engine room: some parts can have temperatures exceeding 600 degrees Celsius. These parts must be properly covered.

The SOLAS (Safety of Life at Sea) convention, ratified by the IMO, aims to keep merchant ships safe. The treaty has several chapters, but in short it limits how hot the surfaces of certain engine components are allowed to be, in order to cut the risk of fire. It also defines what kind of spray or splash protection should be used near flammable liquid systems such as the fuel and lubricating oil system.

By installing SOLAS solutions on turbochargers, exhaust gas pipes and fuel and oil spray/splash protection, engine room surface temperatures can be kept below 220 degrees Celsius, in line with SOLAS regulations.

"A fire in the engine room typically originates in a failure in the fuel and lubricating oil system, which is then followed by impingement of oil onto a high temperature surface," explains Salo.

Wärtsilä's SOLAS solutions keep the fuel and the heat away from each other, as the hot surfaces are lined.

Why now?

The SOLAS convention has been in force for over ten years, and awareness of engine room safety is now at an all-time high. The trend has also materialised in the order book for Wärtsilä's SOLAS solutions. It's partly due to the fact that the average installation base is reaching the age when safety upgrades are being considered. But a big driver is the overall raised level of safety awareness (we all ride a bike with a helmet these days, right?). It has stirred up the shipping industry as well, with owners and operators getting on trend. News of near-misses and engine room fires spread like digital wildfire in these times of social media, too.

New ships are built to be SOLAS-compliant. A fire down in the engine room tends to have a paralyzing effect on the whole vessel. This is the reason why dual engine rooms are becoming increasingly common on modern ships – should a fire occur in one of the engine rooms, the other one is still operable.

(Retrieved: 11 June, 2015 from www.wartsila.com)

True or False?

- The sailor’s profession was not as safe in the past as it is now.
- Nowadays, the most serious safety risk is flooding in the engine room.
- The temperature of some unprotected engine components and engine room surfaces can be higher than 600 degrees Celsius.
- The convention which aims to keep merchant ships safe is the MARPOL.
- The whole shipping industry cannot realise the importance of engine room safety concerning fire.
- A fire in the engine room can dramatically affect the operation of the whole vessel.

Answer the questions

1. What does the great number of shipwrecks testify?
2. What are some of the requirements of the SOLAS convention?
3. How can engine room surface temperatures be kept below 220 degrees Celsius?
4. As per Jyrki Salo, how can a fire in the engine room start?
5. Why are modern ships built with dual engine rooms?

GOOD LUCK!!!