MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English
Academic year: 2015 – 2016 **Exam period: June 2016**
Semester: E **Date:**
Name: **Exam paper grade:**
Student number:
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FINAL EXAM

1. Fill in the gaps using the words below. (15 p.)

cavitation injection rotating overheated drain prevent water explosion

maintenance solution lubricating fresh warning pressures principle

-- In freezing weather, you must carefully _____ all passages and pockets in the engine that contain _____ water and are subject to freezing, unless an antifreeze _____ has been added to the water.
-- When fuel reaches the _____ system, it should be absolutely free of water and foreign matter.
-- _____ is the formation and bursting of vapour bubbles in _____ near a moving propeller blade in regions of low pressure due to Bernoulli's _____.
-- The cylinder relief valve is designed to relieve _____ in excess of 10% to 20% above normal.
-- The oil mist detector does not reduce or _____ the formation of mist, but it only gives _____ in case concentration rises above the level at which an _____ can take place.
-- Oil mist is created in the crankcase when the _____ oil is splashed by the reciprocating and _____ parts of the engine.
-- An _____ diesel engine can become a source of fire and extreme havoc if periodic _____ and proper practices are not carried out.

2. Fill in the gaps using the words below. (15 p.)

sensitivity relief vent steps filters power samples release

pressure dirty centrifuge bilges mist fire wear

-- When engines are stopped, you must _____ all starting-air lines because serious accidents may occur if _____ is left on.
-- You must keep the engine clean at all times and take _____ to prevent oil or fuel from accumulating in the _____ or in other areas in order to prevent _____ hazards.
-- You must thoroughly _____ the fuel before using it, and you must keep the _____ clean and intact.
-- Cavitation can waste _____, generate considerable noise, create vibration and _____, and cause damage to the propeller.
-- The _____ of the oil mist detector should be checked on a regular basis. As all the _____ contain a small amount of _____, the lenses and mirrors tend to get _____ and thus require periodic cleaning.

-- Pressure _____ valves should be provided with wire mesh to prevent the _____ of flames inside the engine room.

3. Choose the correct alternative of the words in italics. (15 p.)

It is a bit difficult to read the early signs of a crankcase explosion. This is because the indications are ***similar / different*** to many other emergency situations. But there are few pre-explosion signs that can be read. Crankcase explosion will lead to:

- Sudden increase in the ***inlet / exhaust*** temperature
- Sudden ***increase / decrease*** in the load of the engine
- ***Regular / irregular*** running of the engine
- Incongruous noise of the engine
- Smell of the white mist.

In case of these indications, engine ***load / speed*** should be brought down immediately and the supply of fuel and air should be stopped. The system should then be allowed to cool down by ***opening / closing*** the indicator cocks and turning on the internal cooling system.

Crankcase explosions can be prevented by avoiding the generation of hot spots. They can also be prevented in the following ways:

- By providing proper lubrication to the reciprocating parts, thus avoiding high ***temperatures / pressures***.
- By avoiding overloading of the engine
- By using bearings with ***black / white*** metal material which prevents rise in temperature.
- By using oil mist detector in the crankcase with proper ***vision / visual*** and audible alarm. Oil mist detectors raise an alarm if the ***concentration / condensation*** of oil mist rises above the permissible limit.
- Pressure ***regulating / relief*** valves should be fixed on the crankcase for the instant release of pressure. They should be periodically ***temperature / pressure*** tested.
- Crankcase doors should be made of strong and durable material. Vent ***pipes / ports*** shouldn't be too large and should be checked for any choke up.
- In the event of an explosion, the crankcase doors should never be opened until the system has totally ***calmed / cooled*** down.
- Fire extinguishing medium should be kept standby. In many systems, ***exhaust / inert*** gas flooding system is directly connected to the crankcase.

4. Complete the sentences with the appropriate form of the words in parentheses. (20 p.)

-- I have an important _____ **(appoint)** with the crew manager of Euronav, concerning a future _____ **(cooperate)** with them.
-- The _____ **(maintain)** and _____ **(instruct)** manuals given by the engine _____ **(construct)** are kept in the engine room.
-- When the lube oil becomes unfit for further usage, it needs either some kind of _____ **(treat)** or _____ **(replace)**.
-- The 3rd engineer with the _____ **(assist)** of a crew member of the engine room proceeded to the _____ **(adjust)** of the _____ **(govern)**.
-- Materials which offer low _____ **(resist)** to electric current are called conductors.

-- The company's new container ship is under _____ **(construct)** but it won't be finished until 2016.
-- _____ **(regular)** running of the engine may be an _____ **(indicate)** of the governor's _____ **(function)**.
-- During overhauling you should check all pipe _____ **(connect)**.
-- The effect of _____ **(vibrate)** on the engine structure is quite _____ **(harm)**.
-- International regulations try to reduce the _____ **(emit)** of ships' fuels.
-- During our last voyage we took many _____ **(save)** measures due to the highly dangerous cargo we were carrying.

5. Write the opposites of the following words. Then use five (05) of them to fill in the gaps. (10 p.)

-- efficient
-- compose
-- legal
-- assemble
-- experienced
-- appropriate
-- obey
-- possible
-- equality
-- moral

-- The crew members of the engine room had to _____ the cylinder liner in order to overhaul it.
-- If you _____ the orders, you'll be severely punished.
-- Due to _____ operating conditions, the engine slowed down.
-- By electrolysis, you can _____ water into hydrogen and oxygen.
-- It is _____ to dump oil and other harmful substances into the sea.

6. Match the words to their definitions. There is one extra word. (10 p.)

choke disperse adverse restricted durable condense

momentum range periodic accumulate fatal

causing or resulting in death _____
vary between limits _____
build up _____
able to last, long-lasting _____
scatter or spread in different directions _____
clog _____
the quantity of movement in a body _____
(of a gas) become liquid, esp. by becoming cooler _____
happening at regular times _____
limited _____

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

Some engine surfaces onboard 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!!!