MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English
Academic year: 2016 – 2017 **Exam period: February 2017**
Semester: E' (old students) **Date:**
Name: **Exam paper grade:**
Student number:
Instructor: A. Birbili

FINAL EXAM

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

Azipods propeller governor oil conformity addition thrust straight

regulations bearings load properties manoeuvrability unburnt speed

-- As the _____ is used to lubricate the engine, its _____ deteriorate over a period of time due to the _____ of impurities which could include _____ fuel, water, acids, suspended particles and so forth.
-- Once the _____ of the engine has been set, the role of the _____ is to maintain that speed despite the variations in _____.
-- _____ are used to support the shafting in a _____ line between the main engine and the _____.
-- A marine diesel engine has to be maintained in _____ with the various international rules and _____ as well as the advice of the manufacturer.
-- _____ are the most advanced option when _____ is really valuable to the vessel since these systems can turn 360 degrees and _____ can be directed at any direction.

2. 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.

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

cavitation drain running detector flames principle vent solution

blade explosion fresh crankcase relief warning pressure

-- 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.
-- _____ is the formation and bursting of vapour bubbles in water near a moving propeller _____ in regions of low pressure due to Bernoulli's _____.
-- The oil mist _____ does not reduce or prevent the formation of mist, but it only gives _____ in case the concentration rises above the level at which an _____ can take place.
-- When engines are stopped, you must _____ all starting-air lines because serious accidents may occur if _____ is left on.
-- Pressure _____ valves should be provided with wire mesh to prevent the release of _____ inside the engine room.
-- Oil mist is created in the _____ when the lubricating oil is splashed by the _____ components of the engine.

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

-- The main shaft is supported and held in _____ **(align)** by bearings.
-- When the temperature of steam reduces, _____ **(condense)** takes place.
-- _____ **(prevent)** measures should always be taken during bunkering.
-- When the fuel reaches the _____ **(inject)** system, it should be _____ **(absolute)** free of water and foreign matter.
-- International regulations try to reduce the _____ **(emit)** of ships' fuels.
-- The _____ **(sensitive)** of the oil mist detector should be checked on a regular basis.

-- The screw-type propeller is the _____ **(propel)** device used in almost all ships.
-- In _____ **(control)** pitch propellers, the pitch can be adjusted by a hydraulic mechanism which allows the blades to turn on their own axis.
-- Depending on the _____ **(long)** of the shaft, there can be two or more shafts coupled by bolting _____ **(arrange)**.
-- The authorities used _____ **(disperse)** to break up the oil spill in the Gulf of Mexico some years ago.
-- The lubricating oil used in _____ **(corrode)** conditions such as lubrication of cylinder liners is mixed with certain _____ **(add)** to make it alkaline.
-- Cavitation can waste power, generate _____ **(consider)** noise, create _____ **(vibrate)** and wear, and cause damage to the propeller.
-- _____ **(regular)** running of the engine may be an _____ **(indicate)** of the governor's _____ **(function)**.
-- Materials which offer low _____ **(resist)** to electric current are called conductors.

5. Match the words to their synonyms/definitions. There is one extra word. (15 p.)

condense dependable attempt momentum stationary defect build up

choke disperse ductwork impact durable chock range rupture limited

standing still; not moving _____
clog _____
accumulate _____
fault _____
able to last, long-lasting _____
effort _____
vary between limits _____
cause to break or burst _____
(of a gas) become liquid, esp by becoming cooler _____
restricted _____
the quantity of movement in a body _____
the total of all pipes or tubes _____
reliable _____
scatter or spread in different directions _____
having a powerful influence on sth/smb _____

6. Write the opposites of the following words. (5 p.)

-- ingress
-- efficient
-- manned
-- reasonable
-- equal
-- equality
-- obey
-- balance
-- formation
-- reduce

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!