

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

**Course: Maritime English**

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**FINAL EXAM**

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

*wear structure operating damp transmits vibrations rotation hull*

*deformation propulsion intensity crankshaft increase loosening arrangement*

When \_\_\_\_\_ occur in big-sized machines, \_\_\_\_\_ under heavy loads, the \_\_\_\_\_ of vibration magnifies because of large mass \_\_\_\_\_ and combustible gases forced inside the machinery. If the vibration levels \_\_\_\_\_ beyond the minimal level, it may lead to \_\_\_\_\_ or breakage of engine components. It is therefore important to \_\_\_\_\_ the vibration by some external \_\_\_\_\_. In a 2-stroke marine \_\_\_\_\_ engine, vibrations may cause \_\_\_\_\_ of internal components, \_\_\_\_\_ of holding bolts, damage to the engine \_\_\_\_\_, and even failure of the \_\_\_\_\_. Bracing, which is normally fitted on the top of the engine, \_\_\_\_\_ the rocking vibration of the engine to the \_\_\_\_\_ of the ship.

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

- \_\_\_\_\_ (**complete**) scavenging results in poor combustion, lubricating oil \_\_\_\_\_ (**contaminate**), piston rings wear, as well as high mean temperature in the cylinder.
- Silicone is a highly \_\_\_\_\_ (**viscosity**) fluid.
- \_\_\_\_\_ (**satisfy**) scavenging depends on efficient \_\_\_\_\_ (**evacuate**) of exhaust gases and minimum \_\_\_\_\_ (**lose**) of fresh air through the exhaust passage.
- \_\_\_\_\_ (**detune**) are used to alter the frequency of the vibrating machinery reducing the vibration of the engine.
- Ship machinery \_\_\_\_\_ (**install**) have two principal sources of \_\_\_\_\_ (**excite**): the main engines and the \_\_\_\_\_ (**propel**).
- The information recorded in the log book is used as a future \_\_\_\_\_ (**refer**).
- Any prolonged \_\_\_\_\_ (**expose**) to levels of 85dB or above is likely to lead to hearing problem in the \_\_\_\_\_ (**absent**) of ear protection.
- \_\_\_\_\_ (**insulate**) techniques and the prevention of local resonance are used to keep the vibrations in the \_\_\_\_\_ (**accommodate**) and at other locations within \_\_\_\_\_ (**accept**) levels.
- Log books are \_\_\_\_\_ (**office**) records. Wrong \_\_\_\_\_ (**read**) should be crossed out and the correct ones must be written beside them along with the \_\_\_\_\_ (**sign**) of the \_\_\_\_\_ (**authority**) officer.

**3. Match the terms from physics and mechanics below to their definitions. There is one extra term. (10 p.)**

*amplitude      frequency      resonance      damp      velocity      detune*

*torsion      oscillation      natural frequency      vibration      damper*

- the speed of something in a particular direction:
- frequency at which a system oscillates when it is not subjected to a continuous or repeated external force:
- the greatest distance that a sound or radio wave vibrates:
- twisting, esp. of one end of sth while the other end is held fixed:
- the sound or other vibration produced in an object by sound or vibrations of a similar frequency from another object:
- a device for reducing mechanical vibration:
- change the frequency (of an oscillatory system) away from a state of resonance:
- a continuous quick, slight shaking movement:
- the rate at which a sound (or electromagnetic wave) vibrates:
- movement back and forth in a regular rhythm:

**4. Match the following words to their synonyms. (10 p.)**

*uneven    aperture    defect    stiff    tidy    exclude    replenish    resilient*  
*feasible    appropriate*

- rigid, firm: \_\_\_\_\_
- flexible: \_\_\_\_\_
- irregular: \_\_\_\_\_
- refill: \_\_\_\_\_
- suitable: \_\_\_\_\_
- an opening, hole or gap: \_\_\_\_\_
- neat: \_\_\_\_\_
- able and possible to be done: \_\_\_\_\_
- fault: \_\_\_\_\_
- rule out: \_\_\_\_\_

**5. Fill in the gaps using the words in the list below. (15 p.)**

*discomfort    crankshaft    combustion    oscillation    energy    scavenging    disposal*

*evolved    torsional    steaming    exhaust    air    torque    log    absorbing*

- \_\_\_\_\_ vibration is a twisting phenomenon in the \_\_\_\_\_ which spreads from one end to the other due to uneven \_\_\_\_\_ pulses coming from different unit pistons.
- Dampers are used to damp or reduce the frequency of \_\_\_\_\_ of the vibrating components of the machine by \_\_\_\_\_ a part of the energy \_\_\_\_\_ during vibration.
- \_\_\_\_\_ is the process of removing \_\_\_\_\_ gases from the cylinder after \_\_\_\_\_, and replenishing the cylinder with fresh \_\_\_\_\_.
- High levels of noise may cause \_\_\_\_\_ and annoyance to the crew.
- \_\_\_\_\_ books record all sludge and garbage \_\_\_\_\_ operations.
- The extremely slow \_\_\_\_\_ of ships has become the mainstream as a result of the recent \_\_\_\_\_-saving trend.

**6. Match the words to make appropriate collocations. (10 p.)**

-- flexible.....	crankpin
-- for future.....	conditions
-- working.....	claims
-- insurance.....	reference
-- fatigue.....	operation
-- at any given.....	inspection
-- scored.....	time
-- PSC.....	on board
-- remaining.....	of machinery
-- bunkering.....	coupling

**7. Cross the odd one out from the words in bold. (5 p.)**

- *flexible, stiff, resilient* mounting
- *excite, damp, attenuate* noise/vibration
- *fatigue, breakage, torsion* of machinery
- *remedy, cure, deformation* for a problem
- *overheated, objectionable, scored* crankpin

**8. Choose either A or B. (15 p.)**

**A. Read the following article and answer the questions that follow.**

**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](http://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 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?

**B. Write a short text on the following topic: Discuss the problem of vibration. Causes, preventive measures, and ways to reduce its consequences. (Approximate length 100 words).**

***GOOD LUCK!!!***