

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

**Course: Maritime English**

**Academic year: 2016 – 2017**

**Exam period: September 2017**

**Semester: E' (Retakes-Manila)**

**Instructors: A. Birbili, E. Botonaki, M. Tsompanoglou**

**Exam paper grade:**

**Name:**

**Student number:**

**Date:**

**FINAL EXAM**

**1. Fill in the gaps using the words in the list below. (10 p.)**

*failure      gases      damp      transmits      hull*

*deformation      propulsion      loads      bolts      vibrations*

When \_\_\_\_\_ occur in big-sized machines, operating under heavy \_\_\_\_\_, the intensity of vibration magnifies because of large mass rotation and combustible \_\_\_\_\_ forced inside the machinery. If the vibration levels increase beyond the minimal level, it may lead to \_\_\_\_\_ or breakage of engine components. It is therefore important to \_\_\_\_\_ the vibration by some external arrangement. In a 2-stroke marine \_\_\_\_\_ engine, vibrations may cause wear of internal components, loosening of holding \_\_\_\_\_, damage to the engine structure, and even \_\_\_\_\_ of the crankshaft. 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.)**

- High levels of noise may cause \_\_\_\_\_ (**comfort**) and \_\_\_\_\_ (**annoy**) to the crew.
- Log books record all sludge and garbage \_\_\_\_\_ (**dispose**) operations.
- 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**).
- Any prolonged \_\_\_\_\_ (**expose**) to levels of 85dB or above is likely to lead to hearing problem in the absence of ear \_\_\_\_\_ (**protect**).
- \_\_\_\_\_ (**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. Complete the following text with an appropriate word. The first letter is given. (15 p.)**

S..... is the process of removing e..... gases from the cylinder after c....., and replenishing the cylinder with fresh a..... Efficient scavenging is necessary for the good combustion of f..... inside the engine cylinder. Scavenging is important, because it affects the overall e..... of the engine, the power output and the fuel c..... Incomplete scavenging results in poor combustion, l..... oil contamination, piston rings w....., as well as high mean t..... in the cylinder.

**4. 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 greatest distance that a sound or radio wave vibrates:
- twisting, esp. of one end of sth while the other end is held fixed:
- 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 sound or other vibration produced in an object by sound or vibrations of a similar frequency from another object:
- a continuous quick, slight shaking movement:
- the rate at which a sound (or electromagnetic wave) vibrates:
- a device for reducing mechanical vibration:
- change the frequency (of an oscillatory system) away from a state of resonance:
- movement back and forth in a regular rhythm:

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

*reverberate*    *aperture*    *defect*    *stiff*    *tidy*  
*feasible*    *appropriate*    *enhancement*    *replenish*    *resilient*

- rigid, firm:
- flexible:
- (of a sound) to be repeated several times:
- refill:
- suitable:
- an opening, hole or gap:
- neat:
- able and possible to be done:
- fault:
- reinforcement:

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

*erratic log shaft twisting turbochargers pulses noise energy low*

*crankshaft heat malfunctions electric steaming axial*

- Torsional vibration is a \_\_\_\_\_ phenomenon in the \_\_\_\_\_ which spreads from one end to the other due to uneven torque \_\_\_\_\_ coming from different unit pistons.
- An engineer on board can identify something \_\_\_\_\_ in the equipment by feeling the \_\_\_\_\_, or by listening to the \_\_\_\_\_, or by watching the status of the device.
- The engine room \_\_\_\_\_ book is a track record of all the ship machinery parameters, performance, maintenance, and \_\_\_\_\_.
- The extremely slow \_\_\_\_\_ of ships has become the mainstream as a result of the recent \_\_\_\_\_-saving trend.
- The \_\_\_\_\_ damper is fitted on the crankshaft of the engine to dampen the \_\_\_\_\_-generated vibration.
- Mitsubishi Heavy Industries Marine Machinery has developed an \_\_\_\_\_-assist system for large \_\_\_\_\_ for marine diesel engines and verified high energy saving advantages in the \_\_\_\_\_-load operating range of the engine.

**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.**

**FIRE IN THE ENGINE ROOM!**

As any seafarer who has experienced it will undoubtedly agree, a fire at sea is a frightening experience. The fire brigade may be thousands of miles away! The most common ship fire is in the engine room, and the usual cause is oil leaking from pipes under high pressure, specifically from the fuel pump discharge.

When a high-pressure fuel line fractures or a gland leaks, fuel oil is released as a fine spray that will readily ignite upon contact with a hot surface such as the engine exhaust. The resulting blaze is immediately fierce, and being constantly fed with fuel from the high-pressure line, will rapidly become impossible to fight with extinguishers and hoses. It will probably be necessary to evacuate the engine room within a very few minutes, and use the remote stops to stop the pump and shut-off the fuel supply. Damage will be severe, with a high risk of loss of life, and the ship may well be lost.

Because of the high risk and severe consequences from high-pressure oil line leaks, the fuel oil pump discharge lines are double-skinned so that any fuel leaks are contained and the leakages are safely drained into a tank. The integrity of the outer skin is essential to prevent any leaking oil from being sprayed over a hot surface and the consequent fire.

**DO** regularly check the fuel oil drain tank and ensure the alarm is functioning so that any leakage from the inner pipe is detected.

**DO** ensure that the outer protective skin of fuel oil pump discharge lines is frequently checked and immediately renewed if any damage or deterioration is found.

**DO** confirm that the remote stops and quick-closing valve mechanisms work by regular testing – and that the ship's crew know where they are and how to use them.

(Retrieved: 09 September, 2015 from [www.britishmarine.com](http://www.britishmarine.com))

1. What is the most usual fire on board and how is it caused?
2. What happens when there is fuel leakage in the engine room?
3. How can you prevent a fire in the engine room from spreading to the rest of the ship?
4. Why are the fuel oil pump discharge lines double-skinned ?
5. What advice is given in the article to minimise the risk of fire in the engine room?

**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!!!*