MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English V **Semester: E**
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Student's number:

Instructors: A. Birbili, M. Tsompanoglou **Exam paper grade:**

FINAL EXAM

1. Complete the sentences about the common reasons for diesel engine vibration using the words in the box. There are two extra words. (15 p.)

transmit	hull	shaft	misalignment	rotating
excitation	auxiliary	mounts	reciprocating	imbalance
gearbox	resonance	foundations	increased	reduction
camshaft				natural

-- Imbalance in _____ components such as the crankshaft.
-- _____ of engine components such as the crankshaft and _____.
-- Worn engine _____. These are designed to isolate the engine from the rest of the vessel's structure. If they are worn or damaged, they can lead to _____ transmission of engine vibration to the _____ or superstructure.
-- Harmonic _____. Certain engine speeds may result in a condition where _____ frequencies of engine components coincide with _____ frequencies, amplifying vibrations.
-- Propeller issues. Vibrations from the propeller _____ can be transmitted to the engine through the coupling or _____, leading to engine vibration. This can occur due to propeller _____, damage or fouling.
-- _____ equipment such as pumps, compressors or generators can _____ vibrations to the engine through mounting structures or shared _____.

2. Complete the sentences with an appropriate word. In some cases the first letter is given. (15 p.)
-- Tuned Mass Dampers consist of an additional mass that is tuned to a specific **f**_____ to counteract vibrations.
-- _____ bracings are widely used to control the vibrations of _____ engines on board ships.
-- In **l**_____-scavenged engines, the charge air passes over the piston _____ and rises to form a circle within the cylinder.
-- An electrically-driven auxiliary _____ is usually installed on 2-stroke engines, because the air provided at _____ engine speeds is not enough.
-- Unlike the 4-stroke diesel engine, a 2-stroke one does not use the _____ to push out the exhaust gases.
-- **S**_____ is the process of supplying an IC Engine with air at a pressure greater than atmospheric.
-- The purpose of the gas exchange process is to remove the burnt gases at the end of the _____ stroke, and admit fresh air for the next cycle.

3. Circle the correct answer. (10 p.)

-- **Frequency/ Vibration/ Resonance/ Volume** is the vibration produced in an object by another object vibrating at a similar frequency.
-- **Aligning/ Bearing/ Arranging/ Balancing** for marine diesel engines means making sure all moving parts are evenly weighted.
-- Viscous type dampers consist of an inertia ring which is enclosed in a layer of **silicon/ silicone/ grease/ rubber**.
-- **Torsional/ Axial/ Twisting/ Rotational** dampers are used to address twisting vibrations caused by uneven torque pulses.
-- **Excitement/ Attenuation/ Excitation/ Vibration** is the process in which an atom, or other particle, adopts a higher energy state when energy is supplied.
-- **Attenuation/ Natural frequency/ Resonance/ Oscillation** is the frequency at which a system oscillates when it is not subjected to a continuous or repeated external force.
-- The **rotational/ linear/ torsional/ axial** damper is fitted on the crankshaft to reduce the forward and aft shaft oscillations.
-- **Balancers/ Dampers/ Bracings/ Shock-absorbers** are generally fitted on the exhaust side of the engine to prevent resonance within the engine's operational range.
-- Installing a permanent type vibration meter on critical machines can give us signs of wear and **fear/ fretting/ tear/ damage** to be rectified well in advance before the fault converts into an expensive problem.
-- Continuous monitoring of vibrating components and detection of critical overloads can prevent damage and reduce **uptime/ downtime/ overtime/ daytime** for repairs.
-- Older engines were "naturally **aspirated/ scavenged/ charged/ loaded**" - taking fresh air only at atmospheric pressure.
-- An entry for all the lube oil **resting/ remaining/ staying/ keeping** on board must be made in the engine room logbook every day.
-- All important machinery parameters noted down in the logbook can be compared with the design and **sea/ check/ effort/ trial** conditions at regular intervals in order to analyse the performance of engine room machinery and systems.
-- The speed of the ship in **kilometers/ knots/ nautical miles/ miles** is also recorded in the logbook.
-- The piston **crown/ pin/ skirt/ rod** of a loop-scavenged engine is longer than that of a uniflow-scavenged one.
-- The power **outlet/ outcome/ result/ output** of an engine at a given speed is proportional to the mass flow rate of air.
-- Near **losses/ accidents/ misses/ incidents** are discussed during safety meetings as references that can help in making safety plans.
-- In **loop/ cross-flow/ uniflow/ airflow** -scavenged engines, the flow of scavenging air is in one direction.
-- An Ozone **Decreasing/ Depleting/ Discharging/ Dumping** Substances (ODS) Record Book is a legally required logbook for ships with rechargeable systems containing these substances, such as refrigerants.
-- In systems with power turbines connected via reduction gears, flexible **couples/ connectors/ connections/ couplings** compensate for vibrations.

4. Match the following words to their synonyms below. There is one extra word. (10 p.)

mitigate amplitude illegible mean align malfunction

fatigue objectionable oscillation breakdown deviation

-- regular movement between one position and another _____
-- irregular or abnormal operation _____
-- great tiredness, exhaustion _____
-- not clear enough to read _____
-- make something less harmful or serious _____
-- arrange in a straight line _____
-- difference from what is usual or expected _____
-- average _____
-- the maximum extent of vibration _____
-- unpleasant _____

5. Complete the sentences with the appropriate form of the words in parentheses. (15 p.)

-- The engineer _____ **(watchkeep)** should sign the logbook after _____ **(complete)** of the watch, and the Chief Engineer should sign it on a _____ **(day)** basis.
-- The aim of vibration analysis is to determine the _____ **(deteriorate)** condition of equipment before it leads to a breakdown.
-- The lube oil should be checked regularly for water and _____ **(contaminate)**.
-- _____ **(detune)** are used to alter the frequency of vibrating machinery.
-- Vibrations must not result in _____ **(annoy)** and/or _____ **(comfort)** for the crew.
-- All sludge and garbage _____ **(dispose)** operations should be recorded in the log book.
-- _____ **(complete)** scavenging can seriously affect the overall _____ **(efficient)** of the engine.
-- Anti-vibration mountings mainly benefit _____ **(propel)** engines, gensets and diverse auxiliary machinery.
-- High levels of vibration may cause _____ **(form)** or _____ **(break)** of engine components.
-- There are two basic criteria for determining _____ **(accept)** in the levels of vibrations on board ships.

6. State whether the following sentences are True (T) or False (F). (5 p.)

-- The process of removing exhaust gases from the cylinder after combustion and replenishing with fresh air is called charging.
-- Fuel consumption is not affected by scavenging.
--The pressurized air supplied by the turbocharger is cooled to decrease its density before entering the cylinder.
-- The fundamentals of gas exchange process in 2-stroke diesel engines are intake and exhaust.
-- Velocity is the speed of something in a particular direction.
-- 2-stroke diesel engines with an exhaust valve mounted in the cylinder head are known as loop-scavenged engines.

-- The data from the logbooks is often used as evidence in case of accidents.
-- E-logbooks are less secure than paper logbooks because they can be easily tampered with.
-- High vibration levels combined with the presence of water in the lubricating oil may cause damage to the bearings of the engine.
-- Most of the readings and entries noted down in the logbook can also be taken from the engine control room, although it is advisable to take local readings.

7. Match the words to make appropriate collocations/ phrases. (5 p.)

-- insurance _____ *meetings*
-- ventilation _____ *ports*
-- bunkering _____ *set*
-- piston _____ *claims*
-- safety _____ *operation*
-- tank _____ *maintenance*
-- scavenge _____ *seizure*
-- holding _____ *soundings*
-- condition-based _____ *fans*
-- generator _____ *bolts*

8. Look at the following abbreviations used in the logbook. Fill in the missing words. (10 p.)

-- **IFO** _____ fuel oil
-- **BW** _____ water
-- **SSP** _____ of sea passage
-- **PSC** port _____ control
-- **UMS** _____ machinery space
-- **BOB** _____ on board
-- **RPM** _____ per minute
-- **FWE** finished _____ engine/s
-- **ESP** _____ of sea passage
-- **SBE** _____ by engine/s

9. Read the pros and cons of electronic logbooks compared to traditional paper logbooks given below and do the exercises that follow:

i. Put an appropriate title for each one choosing from the titles in the box. (10 p.)

Compliance	**Remote access**	**Integration**	**Data analysis**	**User training**
Security	**Environmental impact**	**Initial costs**	**Dependency on technology**	**Data security concerns**

- _____

They use measures to protect sensitive data and ensure entries are tamper-proof.

- _____

Crewmembers require training to use e-logbook systems effectively, especially if they are accustomed to paper logbooks.

- _____

Electronic records face cybersecurity risks if proper measures are not implemented.

- _____

They can integrate with other onboard systems (monitoring tools & maintenance software), providing a unified platform for operational data.

- _____

Many regulatory bodies accept electronic records if they meet specific criteria, simplifying compliance with regulatory requirements.

- _____

Authorised personnel can access e-logbooks remotely, (such as shore-based management and auditors).

- _____

There can be initial costs associated with implementing e-logbooks, including software, hardware and training.

- _____

Relies on functioning technology (e.g. internet connection), which may be prone to malfunctions or downtime.

- _____

Reduces paper consumption and associated environmental impacts.

- _____

Digital records facilitate trend identification, enabling better decision-making and operational optimisation.

ii. Put the titles of pros and cons in the correct list below. (5 p.)

Pros of e-logbooks	Cons of e-logbooks