

MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English

Academic year: 2021 – 2022

Exam period: June 2022

Semester: B

Date: 10/6/22

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FINAL TEST

Exercise 1. (15 p.)

Describe the following strokes of a 4-stroke diesel engine using the words given below.

suction, compression, propulsion, temperature, TDC, BDC, closes, downwards, upwards, inlet, injection, exhaust, combustion, compresses, cylinder

During the first stroke of the DE, which is the stroke, the valve is opened and the piston is moving Air is drawn into the, and when the piston reaches the, the cylinder is full of air and the inlet valve

In the 2nd stroke, which is called stroke, the piston is moving and the air. Both pressure and rise. All valves are closed, and when the piston is almost at the, the fuel is sprayed into the cylinder by the fuel valve.

In the third stroke, the fuel is burnt and the gases push the piston downwards. Only this stroke provides the power for the of the ship.

Finally, in the last stroke, the piston is moving upwards and the exhaust gases are driven out through the valve.

Exercise 2. (10 p.)

Underline the correct choice of the following sentences about diesel engines.

-- 4-stroke Diesel Engines do not have *scavenge ports/ inlet valves/ exhaust valves*.

-- In a 2-stroke Diesel Engine the piston rod is connected to the connecting rod with the *connection pin/ crosshead pin/ crank pin*.

-- In a 4-stroke Diesel Engine the piston is connected to the connecting rod with the *crosshead pin/ gudgeon pin/ connection pin*.

-- The crosshead slides on the *slippers/ guides/ slides*.

-- 2-stroke Diesel Engines are *slow/ medium/ high* speed engines.

-- The upper part of the piston is the piston *crown/ skirt/ pin*.

-- In a 2-stroke DE the cycle of operation is completed in two strokes of the piston and *one/ two/ three*

revolution(s) of the crankshaft.

-- The conventional 2-stroke Diesel Engine does not have an **injection/exhaust/inlet** valve. It has scavenge **ports/ valves/ boxes**.

-- The connecting rod is connected to the crankshaft with the **crank pin/ connection pin/ crosshead pin**.

Exercise 3. (15 p.)

Fill in the gaps with an appropriate term of boilers. The first letter is given.

-- Boilers are used for producing s..... .

-- The f..... is the place where fuel is burnt.

-- The e..... preheats the feeding water.

-- The s..... has a great number of small tubes and is used to heat the wet steam, before it enters the main steam pipe.

-- The d..... decreases the temperature of the superheated steam.

-- The oil b..... may be placed either at the top of the boiler or at the bottom.

-- Water t..... are pipes which connect the steam drum with the water drum.

-- The feed c..... valve can stop or start the flow of water into the boiler.

-- The s..... measures the salinity of water.

-- The fire-tube boiler is also called S..... boiler.

Exercise 4. (15 p.)

Underline the correct choice of the following sentences about boilers and steam engines.

-- The steam which is collected in the steam drum of the boiler is **dry/ saturated/ superheated**.

-- When the temperature of the steam falls below permissible limits, **evaporation/ condensation/ concentration** takes place.

-- In the boiler, the water **pipe/ tube/ drum** serves as a reservoir of water.

-- Boiler **indicators/ mountings/ tubes** are usually valves and gauges that are attached directly to the pressure parts of the boiler.

-- Water changes into steam in the **water/ generating/ boiling** tubes.

-- In the **condenser/ economizer/ deaerator**, the boiler feed water gets rid of oxygen and other gases.

-- The LP turbine is larger due to the **extension/ expansion/ exhaust** of steam.

-- The **heater/ steam drum/ water drum** is the upper drum of a water tube boiler, where the separation of water and steam takes place.

-- Depending on the case, in the boiler, there may be a/ an **superheater/ water wall header/ attemperator** to decrease the temperature.

-- The water level / **check/ indicator/ control** shows the level of water in the boiler.

- The **steam drum/ main stop valve/ feed check valve** controls the passage of the steam to the engines.
- The steam turbine consists of a rotor that has a set of curved **blades/ stators/ tubes**.
- There two types of steam engines: the reciprocating steam engines, and the steam **turbines/ rotors/ vanes**.
- In the reaction turbine the steam passes first through the **stationary/ reciprocating/ rotating** blades, where it **condenses / expands/ decreases**.

Exercise 5. (10 p.)

Match the following auxiliary machinery with their functions below.

*davit, pump, incinerator, steering gear, windlass, crane
evaporator, generator, fin stabilizer, sewage treatment plant*

- It is used to burn garbage:
- It is used to lift heavy objects, containers, e.t.c:
- It is used to lower lifeboats to the sea:
- Human body waste is treated biologically there:
- It is used to transfer liquids from one place to another:
- It is used to reduce the rolling of the ship:
- It is used to handle the anchor:
- It is used to produce distilled water:
- It is used to manoeuvre the ship:
- It supplies the ship with electrical power and lighting:

Exercise 6. (10 p.)

Match the following words with their synonyms below.

*malfunction, attemperator, steam, port, gauge,
convert, stationary, combustion, saturated, salinometer*

- measures the content of salt in water:
- filled with a little moisture:
- change:
- meter, indicator :
- the vapour of water:
- apparatus which decreases the temperature:
- burning:
- a hole in the cylinder liner:
- irregular or abnormal operation:
- fixed, not in motion:

Exercise 7. (10 p.)

Underline the correct choice of the following sentences about pumps.

- Regenerative pumps are **displacement reciprocating/ displacement rotary/ centrifugal** pumps.
- The diffuser pump is a **rotary/ displacement/ centrifugal** pump.
- A single-acting ram pump is a **rotary/ reciprocating/ centrifugal** pump.
- The diffuser type pump is used on **high/ low** pressure.
- Centrifugal pumps are used for very **high/ low** speeds.
- In a **displacement/ centrifugal/ diffuser** pump, the increase or decrease of the volume of the pump chamber causes the suction or discharge of the liquid.
- **Multistage/ Double acting ram pumps/ reciprocating** pumps are centrifugal pumps.
- In **reciprocating/ centrifugal/ displacement** pumps the liquid is thrown against the casing.
- Vane pumps are **reciprocating displacement/ rotary displacement/ centrifugal** pumps.
- In a **gear-wheeled / centrifugal/ displacement** pump, the vacuum is formed by the teeth on both wheels.

Exercise 8. (15 p.)

Fill in the names of the parts of the following steam power plant.



