MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS

Course: Maritime English
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Instructor: A. Birbili **Exam paper grade:**
Student's name:
Student number:

FINAL EXAM

A. Supply the missing words from the ones given below. There are two extra words. (15 p.)

compression valve combustion B.D.C. cylinder manifold ports downwards T.D.C. gases pressurised scavenge holes pressure expelling upwards self-ignited

When the piston is at the _____ and before it starts its upward movement on its first stroke, the scavenge and exhaust _____ (or exhaust valve) are already open. _____ air has already entered the cylinder _____ the remaining gases through the exhaust ports (or _____). As the piston moves _____ on its first stroke, it covers the _____ ports first and then the exhaust ports. _____ starts. Pressure and temperature rise. When the piston is a little before the _____, the fuel is sprayed into the cylinder and is _____.

At the beginning of the second stroke, the fuel has already been burned. The _____ gases push the piston down. As the piston moves _____, it uncovers the exhaust ports first and the hot _____ escape through the exhaust manifold. _____ drops. So, when the piston uncovers the scavenge ports right after, air enters the _____ under pressure to push the remaining gases out during the scavenge phase.

B. Write the names of the four strokes of a 4-stroke diesel engine and describe the compression stroke. (15 p.)

Names of the four strokes: 1. _____ 2. _____
3. _____ 4. _____
_____
_____
_____
_____
_____
_____

C. Match the terms to their definitions. There is one extra term. (15 p.)

superheater condenser oil burners desuperheater furnace atomiser

water jacket economiser salinometer deaerating feed tank soot blower

air compressor water-tube boiler water tubes steam drum fire-tube boiler

-- The place in the boiler where the fuel is burnt: _____
-- A gauge which checks the salinity of water: _____
-- A great number of small tubes which heat the steam above the saturation temperature: _____
-- The upper drum of a water-tube boiler where the separation of water and steam occurs: _____
-- They supply the fuel and air to the furnace: _____
-- It maintains the desired temperature of the cylinder: _____
-- A device by means of which a liquid is reduced to very fine spray: _____
-- A heat exchanger that transfers heat from the gases of combustion to the boiler feedwater: _____
-- A type of boiler in which combustion gases flow inside the tubes and water flows outside the tubes: _____
-- Water pipes which connect the steam drum with the water drums: _____
-- It supplies compressed air for starting the engine: _____
-- A vessel in which water gets rid of air and other gases: _____
-- It removes the black carbon particles from the tubes of the boiler: _____
-- A device which removes all or part of the superheat from steam by spraying water into it or by using a heat exchanger: _____
-- A device which cools exhaust steam back into water: _____

D. Circle the correct choice. (15 p.)

-- **Fire extinguishers / fire detectors** warn us of a fire in a place.
-- **Motors / Generators** supply the ship with electrical power and lighting.
-- We use the **windlass / capstan** for handling the anchor.
-- 4-stroke diesel engines are connected to the propeller with **turning / reduction** gear.
-- Fuel oil is cleaned in a **separator / evaporator**.
-- When the viscosity of a fuel and/or lub oil is high, a **heater / cooler** can regulate it.
-- A **service / bilge** pump is used to remove water from the machinery space.
-- A lot of garbage can be burnt in the **incinerator / separator**.
-- Fin-stabilisers are used to improve the ship's **manoeuvrability / stability**.
-- In a(n) **impulse / reaction** turbine the steam is directed from the nozzles against the stationary blades and turns the rotor.
-- In order to lower the boats to the sea we use the **steering / launching** gear.
-- **Pumps / cranes** are used for loading and unloading liquid cargo.
-- 4-stroke diesel engines are **medium-speed / slow-speed** engines, operating between **100 / 200** and **900 / 1500** rpm.

E. Underline the correct choice. (15 p.)

-- In a 4-stroke diesel engine the piston is connected to the connecting rod with the ___ pin.
a. crank b. gudgeon c. connection
-- In a 2-stroke diesel engine the piston is connected to the connecting rod with the ___ pin.
a. connection b. crank c. crosshead
-- The steam which is collected in the steam drum of the boiler is ___.
a. dry b. saturated c. superheated
-- Steam transmits ___ energy to the engine.
a. heat b. kinetic c. mechanical
-- When the temperature of the steam falls below permissible limits, ___ takes place.
a. evaporation b. condensation c. concentration
-- In an impulse turbine the steam is directed from the nozzles against the ___.
a. blades b. nozzles c. rotor
-- In a reaction turbine the steam from the boiler comes into a ___ first.
a. high pressure line b. L.P. turbine c. H.P. turbine
-- The L.P. turbine is larger due to the ___ of the steam because of the ___ in pressure.
a. extension b. expansion c. exhaust
a. decrease b. increase c. raise
-- The reaction turbine is ___ than the impulse turbine.
a. faster b. less advantageous c. more efficient
-- The connecting rod is connected to the crankshaft with the ___ pin.
a. crank b. connection c. crosshead
-- The camshaft opens the valves with the help of the ___ rod.
a. piston b. connecting c. push
-- The crankshaft changes the ___ motion of the piston into rotating motion with the help of the ___ rod.
a. reciprocating b. rotating c. oscillating
a. push b. connecting c. piston
-- The valve seats are housed on the cylinder ___.
a. liner b. block c. head

F. Match the words to their synonyms/definitions. (10 p.)

1. stroke -- fixed, not in motion
2. evaporate -- not affected by fire
3. submerge -- burning
4. ignition -- travel of the piston between the T.D.C. and B.D.C.
5. circulate -- grow larger, spread out
6. stationary -- place under water
7. combustion -- be in motion, move around
8. convert -- turn from liquid into vapour
9. fireproof -- firing
10. expand -- change into something else

G. Supply the missing words from the ones given below. There are two extra words. (15 p.)

wall header *generating* *burners* *diesel* *incoming* *closed* *steam* *water* *high* *feed check valve* *drum* *economiser* *circulating* *superheated* *low* *injection* *bottom*

-- The _____ feed water passes through an _____ first before it enters the lower part of the _____ drum.
-- The _____ tubes take the feed water in the water _____, where water is heated by the combustion gases.
-- Water changes into steam in the _____ tubes.
-- Steam turbines need _____ steam.
-- The _____ controls the entry of the water in the boiler.
-- The safety valve is actuated when there is _____ pressure.
-- The water _____ supplies water to the water wall tubes.
-- The _____ may be placed either at the _____ of the boiler or at the top.
-- All valves are _____ when the piston is almost at the T.D.C. and the fuel is sprayed into the cylinder by the fuel _____ valve.
-- In _____ engines heat energy and mechanical energy are produced in the same apparatus.

GOOD LUCK!!!