

CERTIFICATES OF COMPETENCY FOR ENGINEERS (YACHT)

**EXAMINATIONS ADMINISTERED BY THE
SCOTTISH QUALIFICATIONS AUTHORITY
ON BEHALF OF
MARITIME AND COASTGUARD AGENCY**

SMALL VESSEL SECOND ENGINEER

060-02 - OPERATIONAL PROCEDURES, BASIC HOTEL SERVICES AND SHIP CONSTRUCTION

FRIDAY, 30 October 2020

1400-1600 hrs

Examination paper inserts:

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Notes for the guidance of candidates:

<ol style="list-style-type: none">1. Candidates should note that 100 marks are allocated to this paper. To pass candidates must achieve 50 marks.2. Non-programmable calculators may be used3. All formulae used must be stated and the method of working and ALL intermediate steps must be made clear in the answer.
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Materials to be supplied by examination centres:

Candidate's examination workbook

OPERATIONAL PROCEDURES, BASIC HOTEL SERVICES AND SHIP CONSTRUCTION

Attempt ALL questions

Marks for each part question are shown in brackets

1. Describe the method of testing EACH of the following:
 - (a) a bilge high level alarm switch; (3)
 - (b) a diesel engine cooling water high temperature alarm probe; (3)
 - (c) an oil mist detector. (4)

2.
 - (a) State THREE reasons for keeping a log. (6)
 - (b) State the person responsible for compiling the log. (1)
 - (c) State when the log should be compiled and signed. (1)
 - (d) Describe the action to be taken should a mistake be made during writing up the log. (2)

3. With reference to maintenance systems:
 - (a) state the purpose of scheduled maintenance; (4)
 - (b) explain why unscheduled maintenance may be required even if a scheduled maintenance system is in operation; (4)
 - (c) state why breakdowns should be kept to a minimum. (2)

4. With reference to Oily Water Separators and the pumping of bilges, explain the purpose of EACH of the following:
 - (a) a bilge holding tank; (2)
 - (b) an oil drain tank; (2)
 - (c) an oil content discharge monitor; (2)
 - (d) a vacuum breaker; (2)
 - (e) an oil detection probe. (2)

5. Explain, with the aid of a sketch, how an *Aerobic Sewage Treatment* plant operates. (10)

6. With reference to refrigeration systems:
- (a) state the THREE basic principles of refrigeration; (3)
 - (b) sketch a direct expansion free standing mechanical refrigeration system, labelling the MAIN components and indicating where EACH of the three principles stated in part (a) occurs. (7)
7. With reference to reverse osmosis plants:
- (a) describe the sea water pre-treatment process before the water enters the membrane modules; (6)
 - (b) describe how the purity of the permeate is measured; (3)
 - (c) state the limits of impurity in the permeate when produced to World Health Organisation Standards. (1)
8. (a) State TWO types of Tank Anti-Roll Stabiliser systems. (2)
- (b) State the advantages and disadvantages of a stabilising tank system compared to fin stabilisation. (8)
9. Sketch a line diagram of an automatic sprinkler system, labelling the MAIN components. (10)
10. Describe the functions of a watertight bulkhead. (10)