

CERTIFICATES OF COMPETENCY FOR ENGINEERS (YACHT)

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

SMALL VESSEL SECOND ENGINEER

060-03 - AUXILIARY EQUIPMENT PART I

FRIDAY, 04 September 2020

1400-1600 hrs

Examination paper inserts:

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Notes for the guidance of candidates:

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| <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

AUXILIARY EQUIPMENT PART I

Attempt ALL questions

Marks for each part question are shown in brackets

1. With reference to remotely operated quick closing valves:
 - (a) state their purpose; (2)
 - (b) state where they would be fitted; (3)
 - (c) describe how they are tested. (5)

2. A centrifugal bilge pump has not been operating satisfactorily, the air pump was tested and found to be operating correctly.

List FIVE faults that could have caused the problem, stating why EACH fault causes poor operation. (10)

3. With reference to reciprocating air compressors:
 - (a) state the meaning of the term *bump clearance*; (2)
 - (b) explain the effects on operation if the bump clearance is:
 - (i) too large; (2)
 - (ii) too small. (2)
 - (c) explain why the air temperature must be limited in the HP stage, stating how this is achieved; (2)
 - (d) explain how an aftercooler helps remove moisture from the air. (2)

4. Outline the safety precautions which should be taken when carrying out repairs or maintenance on hydraulic systems. (10)

5. Describe ALL the necessary checks of the steering gear before a vessel leaves port. (10)

6. Describe the advantages of using water jets instead of conventional propellers for vessel propulsion. (10)

7. (a) Describe, with the aid of a sketch, how the alignment of a propeller transmission shaft system may be checked. (8)
- (b) State the indications of a high bearing when the shaft is running. (2)
8. Explain EACH of the following electrical terms:
- (a) preferential tripping; (2)
- (b) sequential starting; (2)
- (c) fuse back up protection; (2)
- (d) discrimination; (2)
- (e) non-essential consumer. (2)
9. List TEN routine maintenance checks that should be carried out on a vented type lead acid engine starting battery system. (10)
10. Describe, with the aid of sketches, TWO methods for controlling the speed of a hydraulic motor. (10)