

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, 19 February 2021

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. Sketch a cross-section through a valve suitable for use as an isolating valve in a fire main, labelling ALL parts and stating a suitable material for EACH part. (10)

2. With reference to a centrifugal pump/motor set:
 - (a) state FIVE indications that a fault has occurred; (5)
 - (b) state a possible cause of EACH fault stated in part (a). (5)

3. With reference to air compressors, explain EACH of the following:
 - (a) why an air filter is important; (4)
 - (b) why the compressor should not be allowed to run with a dirty air filter. (6)

4. With reference to pneumatic control systems, explain EACH of the following:
 - (a) why moisture is undesirable; (4)
 - (b) why oil is generally undesirable; (3)
 - (c) why oil may be intentionally introduced into parts of the system. (3)

5. With reference to a hydraulic steering gear:
 - (a) state the purpose of the hunting gear; (2)
 - (b) explain, with the aid of sketches, the action of the hunting gear. (8)

6. (a) Sketch an arrangement for a transverse, water jet thruster. (6)
 - (b) Explain how thrust is created in a water jet thruster. (4)

7. Whilst a single screw vessel is on passage it is noticed that an intermediate shaft bearing is running hot.
- (a) State FIVE possible causes. (5)
 - (b) Explain the procedure that should be followed in order to reach port for further investigation if there were no further causes. (5)
8. (a) State FIVE causes of earth faults. (5)
- (b) Explain how EACH fault stated in part (a) could be rectified. (5)
9. With reference to battery lockers:
- (a) state the requirements for an internal light fitting; (4)
 - (b) explain why the requirements stated in part (a) are necessary. (6)
10. With reference to a windlass that is hydraulically operated by a variable displacement motor, explain the effect of changing EACH of the following:
- (a) the flow rate of hydraulic oil; (4)
 - (b) the displacement of the motor. (6)