

# **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, 02 July 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"><li>1. Candidates should note that 100 marks are allocated to this paper. To pass candidates must achieve 50 marks.</li><li>2. Non-programmable calculators may be used</li><li>3. All formulae used must be stated and the method of working and ALL intermediate steps must be made clear in the answer.</li></ol> |
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Materials to be supplied by examination centres:

Candidate's examination workbook
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## AUXILIARY EQUIPMENT PART I

Attempt ALL questions

Marks for each part question are shown in brackets

1. With reference to quick closing valves:
  - (a) state where they would be fitted; (2)
  - (b) explain how they operate should a fire occur in EACH of the following:
    - (i) the machinery space; (4)
    - (ii) close proximity to the valve. (4)
  
2. (a) State FOUR types of pumps suitable for use in a hydraulic system. (4)  
(b) Explain why the pumps stated in part (a) are suitable for hydraulic systems. (6)
  
3. With reference to air receivers;
  - (a) list FOUR fittings on an air receiver; (4)
  - (b) describe the operation of TWO safety devices. (6)
  
4. With reference to the cleanliness of hydraulic systems on board an ocean going vessel:
  - (a) list FOUR contaminants; (4)
  - (b) describe the steps that should be taken to eliminate the contaminants listed in part(a). (6)
  
5. Sketch a valve operated, rotary vane steering gear, showing the hydraulic system from the directional valve to the rotary vane unit. (10)
  
6. With reference to propellers, explain EACH of the following:
  - (a) TWO advantages of having high skew; (5)
  - (b) TWO advantages of aft rake. (5)

7. Sketch an arrangement for the aft seal of an oil lubricated stern tube bearing. (10)
8. Explain how EACH of the following electrical safety devices may be tested for correct operation:
- (a) a generator reverse power trip; (2)
  - (b) generator over-current alarm; (2)
  - (c) generator over-current trip; (2)
  - (d) emergency generator auto start up; (2)
  - (e) preferential tripping sequence (2)
9. With reference to the connection of shore power supply on a vessel that does not have a shore power converter:
- (a) list the items that would be included on a checklist for supply of power to the vessel; (7)
  - (b) state the effects of running a 60Hz vessel on a 50Hz supply. (3)
10. With reference to control systems:
- (a) state FIVE advantages of using pneumatics; (5)
  - (b) state FIVE advantages of using hydraulics. (5)