

# **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, 28 May 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. (a) Sketch a globe type screw lift valve suitable for sea water service. (7)  
(b) State, with reasons, the materials used for the valve sketched in part (a). (3)
2. (a) Explain how cavitation damage occurs within a pump. (6)  
(b) State, with reasons, TWO operational causes of increased cavitation within a pump. (4)
3. With reference to compressed air systems used for starting air and control purposes:
  - (a) state the pressure used for starting air; (1)
  - (b) explain why the pressure stated in part (a) is necessary; (3)
  - (c) state the pressure used for control air; (1)
  - (d) explain why the pressure stated in part (c) is different to that stated in part (a); (3)
  - (e) explain why the pressure stated in part (c) is greater than that necessary to operate the control equipment. (2)
4. Describe, with the aid of a sketch, a pressure reducing valve suitable for supplying control air from the main starting air supply. (10)
5. List ALL the necessary checks of the steering gear before a vessel leaves port. (10)
6. (a) State SIX advantages of controllable pitch propellers. (6)  
(b) State FOUR disadvantages of controllable pitch propellers. (4)

7. With reference to propulsion shaft intermediate bearings of the plain bearing type, explain EACH of the following:
- (a) how change of alignment due to vessel condition is allowed for; (2)
  - (b) why the shaft must be able to move longitudinally; (4)
  - (c) why the aftmost bearing requires a complete bush but other bearings may have the bush only in the lower half. (4)
8. With reference to intermediate shaft bearings of the roller type, describe, with the aid of a sketch, EACH of the following:
- (a) how some angular misalignment of the shaft is accommodated; (5)
  - (b) how longitudinal movement of the shaft is accommodated. (5)
9. List FIVE safety devices that may be fitted to the main switchboard of a vessel, stating reasons for fitting each device. (10)
10. Describe the FULL procedure for paralleling an incoming a.c generator to another a.c generator connected to the main switchboard. (10)