

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, 27 August 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

OPERATIONAL PROCEDURES, BASIC HOTEL SERVICES AND SHIP CONSTRUCTION

Attempt ALL questions

Marks for each part question are shown in brackets

1. With reference to the International Safety Management code, describe EACH of the following:
 - (a) the Safety Management System (SMS); (5)
 - (b) the role of the Designated Person (DP). (5)

2. Describe the immediate action that should be taken in the event of EACH of the following occurring, stating a possible consequence if the action is not carried out:
 - (a) a high pressure fuel leak on the main engine; (4)
 - (b) severe vibration from the main engine; (3)
 - (c) high cooling water temperature alarm on generator engine. (3)

3. With reference to MARPOL Annex V, garbage record book:
 - (a) state the type of vessel to which the regulation applies; (1)
 - (b) list the NINE categories into which garbage is grouped for the purpose of the *garbage record book*. (9)

4. With reference to bunkering fuel oil, list the actions that should be taken if a spillage occurs. (10)

5. With reference to sewage treatment plants:
 - (a) describe the biological operating principle of an aerobic sewage treatment plant, explaining the dangers if a supply of oxygen is not present; (8)
 - (b) state how a sufficient supply of oxygen is ensured. (2)

6. With reference to the risk of legionella bacteria in air conditioning plants:
 - (a) state FOUR main areas which are considered to be a breeding ground for the bacteria, outlining a reason for EACH; (8)
 - (b) describe how the risks of the existence of the bacteria can be reduced. (2)

7. Sketch a line diagram of a single pass reverse osmosis plant. (10)
8. With reference to the motion of a vessel in the water:
- (a) list the SIX degrees of freedom, describing the meaning of EACH term; (6)
 - (b) sketch the position of a *bilge keel*, describing how it reduces vessel motion. (4)
9. (a) Describe, with the aid of a sketch, how a pressurised system sprinkler head is constructed. (5)
- (b) Explain the operation of the sprinkler head and bulb assembly described in part (a), stating how the alarm is initiated. (5)
10. Explain the meaning of EACH of the following terms:
- (a) LOA; (2)
 - (b) displacement; (2)
 - (c) load line; (2)
 - (d) draught; (2)
 - (e) breadth. (2)