

# **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, 12 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"><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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## OPERATIONAL PROCEDURES, BASIC HOTEL SERVICES AND SHIP CONSTRUCTION

Attempt ALL questions

Marks for each part question are shown in brackets

1. With reference to routine inspections of machinery located in remote unmanned spaces:
  - (a) state FOUR precautions that should be taken to ensure the safety of personnel; (4)
  - (b) state FOUR notices that should be posted at the entrance of unmanned machinery spaces; (4)
  - (c) define the meaning of the term *Machinery Space*. (2)
  
2. With reference to the engine room log book:
  - (a) state THREE reasons for keeping such a log book; (6)
  - (b) state EACH of the following:
    - (i) the person responsible for its compilation; (1)
    - (ii) the interval at which it should be written up and signed; (1)
    - (iii) the procedure to be followed if a correction of entry is required; (1)
    - (iv) the purpose of recording a general abstract for main and auxiliary engines. (1)
  
3. With reference to the engine log books, explain the reasons for recording EACH of the following, stating a possible cause should the readings be outside the normal parameters:
  - (a) LO Sump level; (4)
  - (b) cooling water inlet temperature; (3)
  - (c) inlet manifold air pressure; (3)
  
4. Describe, with the aid of a sketch, a single stage static Oily Water Separator designed to meet MARPOL Annex I requirements. (10)
  
5. (a) With reference to sewage treatment systems, explain EACH of the following terms:
  - (i) aerobic; (2)
  - (ii) anaerobic. (2)(b) Sketch a Biological Sewage Treatment Plant, labelling the MAIN compartments and indicating the direction of flow through the plant. (6)

6. (a) Sketch a thermostatically controlled expansion valve for a vapour compression refrigeration system, labelling all components. (5)
- (b) Describe the operation of the valve sketched in part (a). (5)
7. (a) Describe, with the aid of a sketch, the operation of the silver ion method of water sterilisation. (6)
- (b) Describe how Ultra Violet Light can be used to kill bacteria in potable water. (2)
- (c) Explain the disadvantages of using Ultra Violet Light as a method of sterilisation, stating how this may be overcome. (2)
8. (a) Describe, with the aid of a sketch, the method of attachment of a Bilge Keel to a vessel's hull, explaining the reason for the longitudinal position of the bilge keel, relative to the hull. (7)
- (b) State the advantages and disadvantages of fitting a bilge keel compared with other methods of stabilisation. (3)
9. (a) Explain the need for fitting, location, and operation of an engine room fire main isolation valve. (4)
- (b) State the type of valve used in part (a). (1)
- (c) Describe, with the aid of a sketch, the construction of a sprinkler head. (5)
10. (a) Explain the meaning of EACH of the following terms:
- (i) camber; (2)
- (ii) sheer. (2)
- (b) Describe how EACH of the terms explained in part (a) improve seaworthiness. (6)