

# **CERTIFICATES OF COMPETENCY FOR ENGINEERS (YACHT)**

**EXAMINATIONS ADMINISTERED BY THE  
SCOTTISH QUALIFICATIONS AUTHORITY  
ON BEHALF OF  
MARITIME AND COASTGUARD AGENCY**

**SMALL VESSEL EOOW**

**060-01 - MARINE DIESEL ENGINEERING**

**FRIDAY, 18 August 2023**

**1400-1600 hrs**

Examination paper inserts:

Notes for the guidance of candidates:

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 used
3. All formulae used must be stated and the method of working and ALL intermediate steps must be made clear in the answer.

Materials to be supplied by examination centres:

Candidate's examination workbook



## MARINE DIESEL ENGINEERING

**Attempt ALL questions**

**Marks for each part question are shown in brackets**

1. (a) Show, using sketches, the THREE clearances necessary for efficient piston ring functioning. (3)  
(b) Explain why piston rings are necessary. (2)  
(c) Explain why the clearances sketched in part (a) are necessary. (5)
2. (a) Describe the sequence of events that may cause a crankcase explosion. (6)  
(b) Describe TWO methods of detecting a potential crankcase explosion. (4)
3. With reference to distillate fuel oil material safety datasheets, describe with examples the information that would be included for EACH of the following:  
(a) hazards; (4)  
(b) first aid; (3)  
(c) fire fighting measures. (3)
4. Describe the procedure for changing over and replacing a duplex type fuel oil filter fitted on the discharge side of a pump. (10)
5. With reference to diesel engine lubricating oil:  
(a) explain how the oil may become contaminated during service; (5)  
(b) describe how to keep the oil in a satisfactory condition. (5)
6. With reference to the main engine cooling water systems:  
(a) explain the purpose of the header tank; (4)  
(b) explain why both heaters and coolers may be fitted; (4)  
(c) state, with reasons, the type of pumps used. (2)

7. (a) Sketch an electric starting motor system, labelling the MAIN components. (5)
- (b) With reference to the starting system batteries in part (a):
- (i) describe the maintenance checks required to prolong the batteries life; (3)
- (ii) describe any safety procedures necessary when handling batteries. (2)
8. (a) State the safety precautions necessary before removing a four stroke diesel engine cylinder head. (4)
- (b) Explain the procedure for removing a four stroke diesel engine cylinder head. (6)
9. Sketch a hydraulically operated, multi-plate, friction clutch, labelling the main components. (10)
10. (a) Describe a gearbox inspection. (6)
- (b) State, with reasons, TWO gear tooth faults. (4)