

CERTIFICATE OF COMPETENCY EXAMINATION

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

SMALL VESSEL EOOW

060-01 - MARINE DIESEL ENGINEERING

FRIDAY, 14 November 2025

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. With reference to diesel engine turbochargers:
 - (a) explain the reasons why they are fitted; (4)
 - (b) sketch an air and gas flow diagram of a pulse type, twin turbocharger, straight six cylinder diesel engine system. (6)

2. With reference to engine timing belts or chains:
 - (a) state the cause of loss of timing drive tension; (2)
 - (b) state how this will affect the engine; (6)
 - (c) explain how slight loss of tension can be corrected. (2)

3. Describe a procedure for manually testing the set points on diesel generator HT cooling water, high temperature alarm and shut down. (10)

4. Describe, with the aid of a sketch, a typical distillate fuel supply system for a diesel engine, including ALL the safety devices. (10)

5.
 - (a) State FOUR purposes of lubricating oil. (4)
 - (b) Explain what is meant by the term *viscosity* of lubricating oil. (2)
 - (c) Describe an onboard method of measuring the viscosity of used lubricating oil. (2)
 - (d) State why the ideal viscosity of lubricating oil must be maintained. (2)

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. With reference to plate type heat exchangers:
- (a) sketch the assembly, labelling the main components and indicating the direction of flow; (5)
 - (b) state the materials used for the plates and seals; (2)
 - (c) state the purpose of the plates being corrugated; (2)
 - (d) state the purpose of *tell tales*. (1)
8. (a) Explain why a diesel engine may fail to run when turned by the starting mechanism. (6)
- (b) Explain the procedure to be adopted in order to solve the problem in part (a). (4)
9. (a) Sketch a pneumatically operated friction clutch, labelling all parts. (7)
- (b) State how the clutch sketched in part (a) may be operated in the event of air failure. (3)
10. With reference to reduction gears, state the advantages and disadvantages of EACH of the following:
- (a) helical teeth compared with spur teeth; (5)
 - (b) double helix compared to single helix. (5)