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, 02 May 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. (a) Sketch a four stroke timing diagram, showing the position of fuel valve, exhaust valve and inlet valve operation. (8)

   (b) Explain the meaning of the term *valve overlap*, stating its purpose. (2)

2. (a) Describe the procedure for setting tappet clearance on diesel engine inlet/exhaust valves. (6)

   (b) Explain the importance of tappet clearances. (4)

3. Describe a procedure for manually testing the set points on a diesel engine lubricating oil low pressure alarm and shut down using a pressure calibrator. (10)

4. With reference to the viscosity of diesel engine lubricating oil:

   (a) explain the meaning of the term viscosity, stating why it is important to the operation of a diesel engine: (3)

   (b) describe an on board viscosity test to determine if engine lubricating oil is fit for further use; (3)

   (c) list the factors which will influence the viscosity of oil in service. (4)

5. (a) Describe FOUR factors influencing centrifugal separator efficiency. (4)

   (b) Explain how oil loss occurs in a separator, stating how this can be minimised. (4)

   (c) State the factors determining the discharge frequency of an engine lubricating oil purifier. (2)

6. With reference to diesel engine cooling water treatment, explain EACH of the following:

   (a) why the treatment is necessary; (4)

   (b) how the treatment is achieved; (3)

   (c) how the effectiveness of the treatment can be determined. (3)

7. With reference to leaking cylinder air start valves:

(a) describe how this may be detected whilst the engine is running; (2)

(b) describe the procedure on discovery; (4)

(c) list FOUR possible causes. (4)

8. Describe the possible causes and remedies for EACH of the following diesel engine faults:

(a) low lubricating oil pressure; (3)

(b) overheating; (3)

(c) unstable speed. (4)

9. With reference to fluid couplings for the main propulsion shaft:

(a) explain the principle of operation; (5)

(b) state how the transmitted torque may be varied; (2)

(c) state THREE advantages. (3)

10. (a) Describe a gearbox inspection. (6)

(b) State, with reasons, TWO gear tooth faults. (4)