

CERTIFICATES OF COMPETENCY FOR ENGINEERS (YACHT)

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

SMALL VESSEL SECOND ENGINEER

060-01 - MARINE DIESEL ENGINEERING

FRIDAY, 04 May 2018

1400-1600 hrs

Examination paper inserts:

--

Notes for the guidance of candidates:

- | |
|---|
| <ol style="list-style-type: none">1. Non-programmable calculators may be used.2. 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:

--

MARINE DIESEL ENGINEERING

Attempt ALL questions

Marks for each part question are shown in brackets

1. Describe the working principle of the four stroke cycle. (10)

2. (a) Sketch a cross section through a resilient/flexible mounting for a diesel engine, labelling the MAIN components. (8)
(b) State the special consideration necessary with respect to the engine installation when using the type of mounting in part (a). (2)

3. List TEN safety devices that may be fitted to a propulsion engine and gearbox arrangement, stating a reason why EACH device is fitted. (10)

4. (a) Explain what is meant by the term *flashpoint* of bunker fuel stored on board. (1)
(b) Describe the importance of knowing the flash point of the bunker fuel stored on board. (1)
(c) Describe a method in common use for ascertaining the flashpoint of bunker fuel. (4)
(d) State the SOLAS requirements, with respect to temperature, for storage of bunker fuel in an engine room. (4)

5. With reference to distillate fuel oil, explain EACH of the following:
(a) why it often needs treatment before the engine; (6)
(b) why it sometimes needs cooling after the engine. (4)

6. Sketch a typical diesel engine cooling water system, describing the purpose of EACH component. (10)

7. Describe the checks and maintenance required for a main engine starting system that uses an air motor. (10)

8. Describe the preparation and checks on a main propulsion system prior to going to sea. (10)
9. With reference to an engine connected to a gearbox via a friction clutch, explain EACH of the following:
- (a) why vibration from the engine should be damped; (7)
 - (b) how vibration damping is achieved. (3)
10. (a) Describe a gearbox inspection. (6)
- (b) State, with reasons, TWO gear tooth faults. (4)