

CERTIFICATES OF COMPETENCY IN THE MERCHANT NAVY
MARINE ENGINEER OFFICER

STCW 78 as amended MANAGEMENT ENGINEER REG. III/2 (UNLIMITED)

040-36 - ENGINEERING, SYSTEMS AND SHIP'S DRAWINGS

WEDNESDAY, 14 DECEMBER 2022

1315 - 1615 hrs

Materials to be supplied by examination centres

Candidate's examination workbook
Graph paper

Examination Paper Inserts

DRG - 120
DRG - 121
DRG - 122
DRG - 123
DRG - 124

Notes for the guidance of candidates:

1. Examinations administered by SQA on behalf of the Maritime & Coastguard Agency
2. Candidates are required to obtain 50% of the total marks allocated to this paper to gain a pass **AND** also obtain a minimum 40% in Sections A and B of the paper.
3. Non-programmable calculators may be used.
4. All formulae used must be stated and the method of working and ALL intermediate steps must be made clear in the answer.



Maritime &
Coastguard
Agency



ENGINEERING, SYSTEMS AND SHIP'S DRAWINGS

Attempt ALL questions

Marks for each part question are shown in brackets

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

Section A

1. DRG.120

- (a) State what EACH the following items are and describe their function in the illustrated system:



- (b) Using drawing references, describe how the aft seal configuration is used to limit leakage. (4)

2. DRG.121

- (a) State how many external casing sections make up the assembly. (2)
- (b) State what item '1' is and describe how it is secured in the casing. (2)
- (c) State what item '2' is and describe its function in the assembly. (2)
- (d) State the adjustments that can be carried out on the assembly and describe how they are achieved. (4)

3. DRG.122

State what EACH of the following items indicate on the illustration:



4. DRG.123

- (a) State what EACH of the following items are and describe their function in the illustrated system.



- (b) State why the combined control air supply is greater than the more used service air. (2)
- (c) Describe how in an emergency, the emergency air system can be used to start the diesel generator engine. (2)

5. DRG. 124

(a) State what EACH of the following items are and describe their function in the illustrated system.



(b) Using drawing references, identify the running motor contactor and describe its location. (2)

Section B

6. DRG.120

- (a) Describe using drawing references, the stern tube oil flow path when the vessel is in fully loaded condition, explaining the purpose of this configuration. (10)
- (b) Describe using drawing references the changes in configuration required when the vessel is discharged to ballast condition, explaining the effect the changes make. (10)
- (c) State when the emergency gravity tank would be used and describe using drawing references the change in configuration required to use it. (5)

7. DRG.121

- (a) Describe disassembly of the illustrated item for overhaul, identifying the TWO main components that suffer wear and describe the checks that would be carried out whilst the assembly is apart. (15)
- (b) Describe the adjustments required after installing the assembled item back in position. (10)









