

HONG KONG POLYTECHNIC  
DEPARTMENT OF NAUTICAL STUDIES

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Course : Certificate of Proficiency in Ship Command  
Class : Part B  
Session : 1990/91  
Subject : Ship Technology  
Date : 10 June 1991  
Time allowed : 3 hours

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Instructions to  
candidates : Attempt questions 1, 2 and 3 and any  
FOUR of the remainder.  
This paper has nine questions.

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Available from  
invigilator :

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1. (a) Describe the process of lighting up a boiler from first filling it with water until a pressure sufficient to blow down a gauge glass is available.
- (b) Describe, with the aid of a simple sketch, how to blow down a gauge glass.
- (c) State any safety device fitted to a gauge glass.

( 20 marks )

2. (a) List the main functions of bulkheads in ships and state the main classification society requirements for bulkheads in ships.
- (b) (i) With reference to the International Convention on Loadlines 1966, state the subdivision requirements for a type B-100 freeboard ship over 225 metres in length.
- (ii) What kind of ship is most likely to qualify as a type B-100 freeboard ship?
- (c) List the main assumptions adopted for the additional calculations required for type B ships of reduced freeboard, and the conditions to be complied with after damage.

( 20 marks )

3. (a) With the aid of a block schematic diagram describe a simple data logger system used in an automated machinery space.
- (b) State three main advantages of using a data logger system.
- (c) Discuss the factors that govern the choice of analogue and digital displays in machinery monitoring systems.

( 20 marks )

4. You plan to paint the inside of a hold on a bulkcarrier, which has been carrying sulphur and fertiliser in bulk, using an airless spray gun. The vessel is on passage in ballast across the Pacific to the Panama Canal and thence to load grain in the United States.

Describe:

- (i) the surface preparaton
- (ii) the type of paint you would use
- (iii) the safety precautions you would adopt.

( 10 marks )

5. Draw up a practical workable checklist covering the organisation of the staff of a 70,000 deadweight crude oil tanker whilst she is in drydock.

( 10 marks )

6. (a) List the essential properties of a primary refrigerant.  
(b) Explain why secondary refrigerants are used in some systems and give an example of a secondary refrigerant.

( 10 marks )

7. (a) Sketch and describe a system by which the forward and after draughts of a ship can be remotely monitored from the bridge.  
(b) State the factors which can influence the reliability of such a system.

( 10 marks )

8. Describe a composite boiler and explain its advantages compared to an oil fired boiler.

( 10 marks )

9. With the aid of sketches describe a connection between a superstructure and the main hull and explain the reasons for using the connection which you have described.

( 10 marks )

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