

HONG KONG POLYTECHNIC  
CENTRE FOR MARITIME STUDIES

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Course : Post Experience Diploma in Ship Command  
Class : Part B  
Session : 1991/92  
Subject : Ship Technology  
Date : Monday, 8th June 1992  
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) Sketch the power transmission arrangement from the crankshaft of a slow-speed direct drive diesel engine to the propeller.
- (b) State the function of each item in the transmission.

( 20 marks )

- ✓ 2. In relation to the International Convention on Loadlines 1966,

- (i) list the main items to be considered before the final freeboard is assigned
- (ii) list the conditions under which the loadline certificate may be cancelled.
- (iii) explain the possible dangers of putting to sea in a ship with less than the appropriate freeboard.

( 20 marks )

- ✓ 3. (a) With the aid of suitable diagrams explain the principle of operation of the following fire detectors:

- (i) a rapid rise of temperature detector
- (ii) an ionisation chamber type combustion products detector.

- (b) State, with reasons, a typical location for each of the detectors in (a) to be installed in a merchant ship.

( 20 marks )

- ✓ 4. Describe the causes and prevention of corrosion of bare steel in air.

( 10 marks )

- ✓ 5. Your vessel has just completed discharging a full cargo of marine salt in Greece and you are to load a full cargo of steel wire coils for discharge in North Africa.

Describe, with reasons, how you would prepare the holds.

( 10 marks )

6. (a) Draw an annotated sketch to show the process of heating water to produce superheated steam in a marine boiler.

(b) State the advantages of superheated steam.

( 10 marks )

7. With the aid of suitable waveform diagrams briefly explain what is meant by proportional-plus-derivative control action and state a specific use on board ship for one such system.

( 10 marks )

8. (a) With the aid of a suitable diagram describe a tape and float system for measuring the oil level in a cargo tank.

(b) Explain how the information from (a) is transmitted to a central control room.

(c) Identify any potential sources of error in this system.

( 10 marks )

9. (a) Sketch and describe a typical fuel oil supply system from the double bottom tanks to the injectors for a marine diesel engine.

(b) Why is viscosity control important in this system?

( 10 marks )

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