

THE HONG KONG POLYTECHNIC UNIVERSITY

CENTRE FOR MARITIME STUDIES

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Course : Post experience Diploma in Ship Command  
Subject : Shipboard Operations  
Class : PeDSC Part B  
Session : 1994/95  
Date : 6 June 1995  
Time allowed : 3 hours (0930 - 1230)

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Instructions to Candidates : Attempt Questions 1, 2 and 3 and any four of the remainder.

This paper has nine questions.  
Minimum pass marks 60%.

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Available from : Cross curves of stability for "Mexna (1)"  
Invigilator : Graph paper.

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A1. Container ship "Mexna 1" has a loaded displacement of 15,600 tonnes. Her KG is 7.2 metres and KM 7.6 metres. She has no slack tanks.

- (a) Using the cross curves of stability supplied with this examination paper, draw the curve of statical stability for the ship.

(10 marks)

- (b) (i) State what information you can obtain from the curve.

- (ii) Determine whether "Mexna 1" meets minimum stability requirements in this condition.

(10 marks)

A2. You are onboard a VLCC with IG and COW. Your ship is discharging a full load of crude oil. Describe in detail how you will clean and gas free the tanks prior to entering drydock after completion of discharge.

(20 marks)

A3. Your vessel is to load a locomotive weighing 96 tonnes using your ship's jumbo derrick of SWL 100 tonnes.

- (a) Describe the preparations and precautions required prior to and during loading.

(15 Marks)

- (b) State how you will rig the derrick.

(5 Marks)

- B4. You wish to check the loaded KG of your ship by means of an inclining test. The weight used for the test is a 20 tonnes container, which is part of your cargo and which, when moved 23 metres transversely across the deck, causes a deflection of 0.15 metres to a plumb line of 12 metres length.

A draft survey shows that the ship is displacing 22,000 tonnes, including the container, and that her KM is 5.5 metres.

What is the ship's KG at this time?

(10 marks)

- B5. A box-shaped vessel is 200 metres in length and has a beam of 20 metres.

She was floating in fresh water at an even keel draft of 10.00 metres and with KG = 5.6 metres, when she bilged a midships compartment which was partly loaded.

This compartment had a length of 10 metres, extended the full width of the ship, and had a permeability of 70%.

After bilging, find the ship's :-

- (a) Displacement
- (b) Mean draft
- (c) GM
- (d) GZ if heeled  $3^\circ$

(10 marks)

- B6. A box-shaped vessel is 100 metres in length, and has a light displacement of 800 tonnes. The vessel's structural weight is uniformly distributed over its length.

It is subdivided into four compartments, each of 25 metres in length.

The two end compartments are each loaded with 400 tonnes of cargo, and the two other compartments are left empty (Total Deadweight = 800 tonnes).

Draw the shear force & bending moment curves for this ship. From the curve find the maximum values of shear force and bending moment, and the positions where they occur.

(10 marks)

B7. State all points to consider while planning to load a full cargo of coal in a general cargo ship.

(10 marks)

B8. State how ship's sweat and cargo sweat are formed. Describe what could be done to avoid the formation of sweat and protect cargo from sweat damage.

(10 marks)

B9. State the action to be taken in case of an overflow of crude oil during loading in a V.L.C.C.

(10 marks)

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