

used for referrals

F

Jan 93

HONG KONG POLYTECHNIC
CENTRE FOR MARITIME STUDIES

Course : Post experience Diploma in Ship Command
Class : Part A
Session : 1992/93
Subject : Navigation
Date : 14 December 1992
Time allowed : 3 hours

Instructions to Candidates : This paper contains TWO sections, A and B

Section A contains THREE questions. Attempt any Two questions - Questions in Section A have equal marks and are each worth 10%

Section B contains SIX questions. Questions 4 and 5 are compulsory and are worth a total of 50%.

Attempt any THREE questions from the remaining 4 questions which carry equal marks and are each worth 10%

A1. Modern ocean going vessels are normally equipped with weather facsimile equipment.

Describe how the Master will use this equipment to route his vessel on a trans ocean passage.

A2. Indicate on the enclosed weather map for 20th June 1990, timed 0600Z:-

- (a) (i) The flow of the warm air masses,
- (ii) The flow of the cold air masses,
- (iii) The occlusion,
- (iv) The cold front,
- (v) The warm front.

(b) Draw a synoptic forecast of an area 5° in each direction centred on 50°N, 30°W for 21st June at 0600Z.

3A. Air masses progressively change in character due to the surfaces they move over.

Describe how an air mass becomes unstable. Include in your description the change of the weather and the slope of the ELR during transformation.

Part B - Compulsory

4B. At 1000 a ship with maximum steaming speed of 16 knots bears $320^{\circ}T$ distant 300 miles from a helicopter base. Her destination is a port which bears $180^{\circ}T$ distant 500 miles.

The helicopter has 3 hours fuel capacity and operating at 100 knots, can land on the ship, but must have 10% fuel remaining on return to base.

Determine :-

- (a) Course to steer for the ship to transfer an injured seaman with minimum deviation from her course.
- (b) Time for helicopter to leave base.
- (c) Time of transfer.

5B. A modern D/F receiver uses fore and aft and athwartship loops, as well as a sense aerial.

Describe using diagrams where appropriate :-

- (a) How the loop aerials are used to determine the direction of the signal.
- (b) Why there is an ambiguity in the signal direction.
- (c) How the sense aerial can be used to remove this ambiguity.

6B. State the immediate action that should be taken by each ship on receipt of a distress message.

7B. Find the height of tide at Castle Peak Bay (7094) at 1900 (-8) on 25th February 1986.

Explain the reasons why the predicted heights of tide as correctly determined for the Tide Tables may vary from the actual heights experienced.

8B. (a) State the main factors affecting the positional accuracy of the hyperbolic navigation system.

(b) Provided that the following induced errors in Loran C received signal is known, then calculate the probable error in the position obtained.

9B. (a) State the factors affecting the measurement of radar bearing.

(b) Provided that the random error in radar bearing amounts to one degree, and the angle of intersection is 120 degrees, then what will be the positional accuracy in this case when the range of an observed object is 12 n.miles.

- End -

