

**DIRECTORATE OF MERCHANT SHIPPING  
GOVERNMENT OF SRI LANKA  
CERTIFICATE OF COMPETENCY EXAMINATION**

GRADE : CHIEF MATE ON SHIPS OF 500 GT OR MORE (UNLIMITED)  
SUBJECT : NAVIGATION  
DATE : 25<sup>th</sup> August 2015

Time allowed THREE hours

Total marks : 180

ANSWER ALL QUESTIONS

Pass marks : 70%

Formulae and all intermediate steps taken in reaching your answer should be clearly shown. You may draw sketches wherever required. Electronic devices capable of storing and retrieving are **not** allowed.

- 1) A vessel is to make a loaded passage between Valparaiso (Chile) to Yokohama (Japan), carrying a cargo of phosphates and is expected to have a departure draught of 16.6 metres.

The vessel carries navigation equipment as per statute and has a service speed of 16.0 knots. The vessel is due to depart Valparaiso on the 1st September.

The vessel is to use the following departure and landfall positions.

Departure Position  $33^{\circ} 03.0' S, 071^{\circ} 48.0' W$

Landfall Position  $35^{\circ} 18.0' N, 139^{\circ} 42.0' E$

Calculate EACH of the following:

- a) The great circle distance; (10 marks)
- b) The final course on the great circle track; (10 marks)
- c) the position of the vertex, lying North of the Equator (15 marks)
- 2) A vessel is in the North Atlantic, at evening twilight, and is steaming on a course  $224^{\circ} T$  at 15 knots and is in DR position  $46^{\circ} 30' N \ 17^{\circ} 40' W$ .

During this period the O.O.W. obtained stellar observations with the following results:

Time	Star	Azimuth	Intercept
1822	A	$270^{\circ}$	5'.2 towards
1826	B	$143^{\circ}$	7'.0 away
1832	C	$175^{\circ}$	4'.4 away
1840	D	$330^{\circ}$	6'.0 towards

The same DR was used in resolving each position line. Find, by plotting, the vessel's Most Probable Position at 1830.

(20 marks)

- 3) Whilst on passage south of the Aleutian Islands the vessel encounters severe weather and a crew member suffers a serious head injury whilst securing equipment on deck.

At 0800 hrs UT on the 21<sup>st</sup> September, whilst in position 52° 48'.0N, 166° 24'.0W the Master makes contact with a US Coastguard cutter in position 55° 18'.0N , 163° 06'.0W and agrees to rendezvous at sunrise the following morning to effect the transfer of the casualty to the cutter.

It is agreed that the bulk carrier will maintain a course of 055° (T) and speed of 13.5 knots. Determine EACH of the following:

- a) the UT of sunrise; (15 marks)
- b) the rendezvous position; (10 marks)
- c) the course and speed required by the coastguard cutter to make the rendezvous. (10 marks)
- 4) a) State the specific responsibilities of EACH of the following when a vessel has a Pilot on the Bridge when transiting a Compulsory Pilotage area.
- i. the Master;
  - ii. the Pilot;
  - iii. the Officer of the Watch. (10 marks)
- (b) List the major items of information that are to be recorded in the Pilot Card. (10 marks)
- (c) When proceeding up-river to a berth, list SIX items of information that the Pilot should tell the Master. (10 marks)
- 5) Tropical Revolving Storms are common at certain times of the year in the South Pacific Ocean, especially to the North of New Zealand and off the East Coast of Australia.
- a) Sketch a plan view of a TRS in the Western South Pacific Ocean, indicating the likely track prior to and after re-curving. (10 marks)
- b) Outline the actions that should be taken by the Master in EACH of the following scenarios, assuming that the storm has re-curved:
- i. the vessel is to the north of the storms track but within the storm field; (05 marks)
  - ii. the vessel is to the south of the storms track but within the storm field; (05 marks)
  - iii. the vessel is in the path of the storm. (05 marks)

c) Compile a set of Masters standing orders for use when the vessel encounters heavy weather for EACH of the following:

i. the OOW;

(05 marks)

ii. general standing orders which are relevant to the safety of the vessel.

(05 marks)

6) Vessels are required to ensure that navigational charts and publications are corrected up to date prior to commencing a passage. This is usually done by using weekly Admiralty Notices to Mariners and chart tracings.

Vessels are also required to ensure that all relevant radio navigational warnings are taken into account when received.

a) Describe the context and content of EACH of the following:

i. Admiralty Weekly Notices to Mariners;

(05 marks)

ii. Navarea warnings;

(05 marks)

iii. Coastal warnings.

(05 marks)

b) Vessels are required to carry charts and publications sufficient to allow planning of the ships intended voyage. State the publications required, for the vessel in question.

(10 marks)