



MERCHANT SHIPPING SECRETARIAT  
GOVERNMENT OF SRI LANKA  
CERTIFICATE OF COMPETENCY EXAMINATION

GRADE : CHIEF MATE ON SHIPS OF 500 GT OR MORE (UNLIMITED)  
SUBJECT : NAVIGATION

DATE : 03rd ~~MARCH~~ April 2019

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 fully loaded vessel with a service speed of 19.0 knots has to proceed on a voyage from a position  $32^{\circ} 48'.0N$ ,  $79^{\circ} 51'.0 W$  towards  $18^{\circ} 03'.0 N$ ,  $16^{\circ} 18'.0W$ .
- a) Calculate the shortest distance on passage. (10 marks)
  - b) Determine the latitude and longitude of the vessel at the northernmost point along the track. (10 marks)
  - c) Determine the distance off an island ( $32^{\circ} 21' N$ ,  $64^{\circ} 48' W$ ) when the vessel crosses longitude  $64^{\circ} 48' W$ , stating whether the vessel passes North or South of the island. (10 marks)
  - d) If the vessel departs at 1000 hrs (UTC-5hrs) on 28<sup>th</sup> June and on her service speed, find the ETA at the Landfall position (UTC-01 hr). (10 marks)

- 2) Whilst in DR position  $28^{\circ} 42'.0 S$ ,  $94^{\circ} 36'.0 W$  the Master requests the OOW to obtain a set of star sights to check the vessel's GPS receiver. The vessel clocks are on UTC -6hrs and the vessel is steaming on a course of  $235^{\circ} (T)$  at 14 knots. Weather conditions are clear with some low broken cloud cover to the Northwest of the vessel.

- a) The OOW obtains the following results:

Time	Star	Azimuth	True Alt	Calc Alt
1745	Canopus	$142^{\circ}(T)$	$42^{\circ} 19'.7$	$42^{\circ} 23'.6$
1750	Arcturus	$270^{\circ} (T)$	$54^{\circ} 12'.3$	$54^{\circ} 13'.7$
1758	Alphard	$062^{\circ} (T)$	$28^{\circ} 15'.6$	$28^{\circ} 09'.7$
1815	Antares	$224^{\circ} (T)$	$19^{\circ} 16'.0$	$19^{\circ} 21'.7$

- i. Plot all FOUR stars for 1800hrs.

(15 marks)

- ii. State, with reasons, which of these are best suited for determining the vessel's position. **(05 marks)**
- b) Determine the vessel's position at 1800hrs. **(10 marks)**
- 3) A vessel has been chartered to an area with sea ice and ice bergs during the winter time.
- a) State the signs of approaching ice. **(10 marks)**
- b) State action to reduce the ice accumulation on ships. **(08 marks)**
- c) Under SOLAS Chapter V, the Master of every ship encountering dangerous ice or conditions that will cause ice accumulation on ships is required to report these conditions. What information should be reported in each of these circumstances? **(10 marks)**
- d) Where you find the format of reporting? **(02 marks)**
- 4) Answer the following questions with regard to master-pilot relationship:
- a) What are the Duties and Expectations of a Pilot? **(10 marks)**
- b) Give a step by step action procedure you will take as Master of the vessel for having found that the pilot's participation in offering his services tend to jeopardized the vessel. **(20 marks)**
- 5) **Give an introductory explanation on the following current display charts commonly known and used by the mariner.**
- a) Current rose charts
- b) Vector mean charts
- c) Predominant current charts
- (10 marks each)**
- 6) You are on fully laden ULCC heavily restricted in maintaining UKC entering Malacca Straits from Bay of Bengal, bound for Singapore.

List down important facts you should have to consider for your passage plan in connection to maintaining the declared ETA for pilot boarding ground Singapore.

**(20 marks)**