

Candidate's Name:

***Ports and Shipping Organization
Examination and Certification Directorate***

Exams Cycle :

Subject : Celestial Navigation

Rank : Chief Mate (GT>3000)

Date :

Time Allowed : 2.5 Hours

01) On 30th July 2000 in DR position 22° 15'S 070° 30' W .The moon set bearing 253° by compass .Find the deviation of compass if the variation was 1.5° W. **(15M)**

02) On 1st of August 2000 in DR position 55° 20'N ,154° 30'W ,the sextant altitude of the star Alioth ,when on the meridian below the pole was 21° 37.5'W. Index error nil, height of eye 14.0m . Find the LMT of the meridian passage and the observer's latitude. **(20M)**

03) An observer on board a vessel in DR latitude 26° 18' S , obtains observed longitude of 164° 24' W and bearing of a heavenly body as 300° T .The ship then steams 280' for 40 miles when a second observation gives a longitude of 165° 00'W ,bearing 020 °T , (DR latitude of 26° 15' S was used).Find the ship's position at the time of the second observation. **(25M)**

04) From the following information on a ship steering 331°(T) at 16 kts, find the most probable position the vessel may be at 17:45 hrs using a common D.R of Lat 32° 22.0'S
Long 111° 11.0'E :

Time	star	Brg(T)	Intercept
17:35	Spica	241°	1.0'(T)
17:40	Rigil kent	142°	2.8'(A)
17:45	Peacock	204°	3.5'(A)

(20M)

05) A ship is to be routed by "METROUTE" the ship routing service of a meteorological office ;

a) List the information that the routing officer will require from the master prior sailing..

(14M)

b) Describe "ship performance curve".

(6M)

Candidate's Name:

***Ports and Maritime Organization
Examination and Certification Directorate***

Exams Cycle :

Subject : Celestial Navigation

Rank : Chief Mate (GT>3000)

Date :

Time Allowed : 2.5 Hours

Q.1) On 24th of December 2000 at 0132 LMT in longitude 148° 54.0' W , the observed altitude of star Polaris was 39° 14.0' ,height of eye =20.4 m .

Find the observer's latitude.

(20 M)

Q.2) From the following informations, find the intercept and the direction of the position line; GMT date & time; 14th August 2000, 10 h 24m 21s. DR position 24°30.0' N, 134°35.80'E. Sextant altitude of the Moon's lower limb; 14° 43.0' .Index error; nil and height of eye 15.5 m.

(20 M)

Q.3) On 6th of January 2000 in DR position 20°30.0' N, 113° 05.0' E , the sextant altitude of the Sun's lower limb. near the meridian was observed to be 46° 25.8' .Index error = 3.0' on the arc and Height of eye = 12.0 m

A chronometer at that time showed 3h 55m 35s and was 12m 35s slow on GMT. Find the direction of the position line and the latitude in which it crosses the DR longitude.

(20 M)

Q.4) After calculating the following simultaneous observations ,using DR ; 15° 46.0' S , 064° 12.0' E , It was noted that the correction for index error has been omitted. Find the vessel's observed position and also the Index error.

Star	Az.	Intercept
-----	-----	-----
a) Capella	023 °	6.4 ' T
b) Procyon	147 °	3.0 ' A
c) Fomalhaut	244 °	1.4 ' T

(25 M)

Q.5) Describe the sources of information which are available to the Master, regarding the latest ice situation in the north Atlantic.

(15 M)

Candidate's Name:

***Ports and Maritime Organization
Examination and Certification Directorate***

Exams Cycle :

Subject : Celestial Navigation

Rank : Chief Mate (GT>3000)

Date :

Time Allowed : 2.5 Hours

Q.1)- From the following information compute the Amplitude , Compass error and the deviation for the ship's head;

The Sunset bearing; 299.5° C , Approximate LMT ;2030 on 17th/ June / 2000

D.R. $47^{\circ} 30.0' N$, $170^{\circ} 20.0' W$, Variation : $10^{\circ} E$.

(20 M)

Q.2)- On 24th / June / 2000 in D.R. Position $35^{\circ} 18.0' N$, $175^{\circ} 18.0' W$ and during evening twilight the sextant altitude of the star Procyon was observed to be $17^{\circ} 21.6'$. Index error ;1.5' on the arc . Height of eye 13.0 m . The chronometer , which was 01m05s fast on GMT ,showed 05h59m19s. Find the intercept and the direction of the position line .

(20 M)

Q.3)-An observation in D.R. Latitude $32^{\circ} 30.0' N$ gave a longitude of $032^{\circ} 08.0' W$ and the bearing of the body as $060^{\circ} T$. The ship then steamed $070^{\circ} T$ for 40 N.Miles , when a meridian altitude gave a latitude of $32^{\circ} 46.0' N$.

Find the ship's position at the time of the meridian altitude.

(20 M)

Q.4)- On 20th/ October /2000 in D.R.Position $15^{\circ} 30.0' S$, $032^{\circ} 21.0' W$, the sextant altitude of the Moon's lower limb when on the meridian to the south of the observer ,was $83^{\circ} 34.5'$, Index error ; 2.0' on the arc .Height of eye 10.0m

Find the latitude and state the direction of the position line.

(20 M)

Q.5)- A 15000 GT vessel is to make a voyage from Durban (S.Africa) to Calcutta (Bay of Bengal) in late July .

a) In chartlet as provided to you; indicate the main currents , winds and any other significant meteorological condition that you are expecting to encounter.

(8 M)

b) State the factors you would be considering to select your route and name the relevant publications which shall be consulted for this purpose.

(12 M)

Candidate's Name:

***Ports and Maritime Organization
Examination and Certification Directorate
Exams Cycle :***

**Subject : Ocean Voyage & Celestial Navigation
Rank : Chief Mate (GT≥3000)**

**Date :
Time Allowed : 2.5 Hours**

Use Nautical Almanac for the Year 2000 , Norie's Tables and work Sheet

Q.1) On July 8th 2000 in D.R: Lat 45° 53.0'S Long 060° 19.0'W, the Sunset bearing 307° by compass (when its center appeared to be on the visible horizon). Using Amplitude Tables find the True Amplitude, True Bearing of the Sun and the Deviation of the Compass if Variation was 4° E.
Also calculate the SMT of sunset if the vessel was keeping GMT - 03:00 hrs.
(15 M)

Q.2) On May 18th 2000 in D.R: Lat 25° 02.0'S Long 111° 42.0'E, find the times (GMT, LMT, SMT) of the Upper Transit of the star Rigel and the setting to put on the sextant for its observation, if index error was 0.8' on the arc, height of eye 18.9m and the vessel was keeping GMT + 07:00 hrs. (20M)

Q.3) On November 2nd 2000 at about 15:50 hrs at Ship in D.R: Lat 10° 45.0'S Long 085° 40.0'W, the sextant altitude of Sun's lower limb was 29° 45.0'. Find the direction of the Position line and a position through which it passes if index error was 1.9' on the arc, height of eye 17.1m and Chron showed 09h 30m 15s being 2m 45s slow on GMT. (25M)

Q.4) You are to make a passage from Durban to Buenos Aires during the month of July:
On the work sheet provided plot the predominant Winds, Currents and other weather related phenomena. (15M)

Q.5) From the following information on a ship steering 280°(T) at 14 kts , find the most probable position the vessel may be at 18:00 hrs using a common D.R of Lat 15° 23.0'N Long 031° 21.0'W :

<u>Time</u>	<u>Star</u>	<u>Brg(T)</u>	<u>Intercept</u>
17:50	Capella	021°	0.6' (T)
17:54	Hamal	078°	3.1' (A)
17:58	Markab	295°	3.5' (T)

Comment on the possible errors involved and the suitability of this fix?
(25 M)