U.S.C.G. Merchant Marine Exam

Master Less than 500-1600 Gross Registered Tons

Q127 Navigation Problems – Oceans

(Sample Examination)
Choose the best answer to the following Multiple Choice questions.

1. On 20 November your 1030 ZT DR position is LAT 27°16.0' N, LONG 157°18.6' E. You are on course 060°T at a speed of 20 knots. You observed 3 celestial bodies. Determine the latitude and longitude of your 1200 running fix.

<table>
<thead>
<tr>
<th>Body</th>
<th>Zone Time</th>
<th>GHA</th>
<th>Observed Altitude</th>
<th>Declination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon</td>
<td>1030</td>
<td>259°24.4'</td>
<td>34°01.5'</td>
<td>N 9°47.3'</td>
</tr>
<tr>
<td>Sun</td>
<td>1116</td>
<td>202°30.5'</td>
<td>43°00.0'</td>
<td>S 19°38.0'</td>
</tr>
<tr>
<td>Venus</td>
<td>1200</td>
<td>162°57.7'</td>
<td>24°26.9'</td>
<td>S 26°02.4'</td>
</tr>
</tbody>
</table>

- (A) LAT 27°16.8'N, LONG 157°30.5'E
- (B) LAT 27°22.6'N, LONG 157°37.8'E
- (C) LAT 27°29.7'N, LONG 157°43.0'E
- (D) LAT 27°33.4'N, LONG 157°48.2'E

*If choice C is selected set score to 1.*

2. On 19 November your 0146 ZT position is LAT 33°48'N, LONG 25°22'E. You observe Polaris bearing 359.8°pgc. At the time of the observation the helmsman noted that he was heading 224°pgc and 222.5°psc. The variation is 2°E. What is the deviation for that heading?

- (A) 2.0°E
- (B) 0.5°E
- (C) 1.0°W
- (D) 1.5°W

*If choice C is selected set score to 1.*

3. On 29 October in DR position LAT 41°12.0'N, LONG 50°18.9'W, you take an ex-meridian observation of the Sun's lower limb, near upper transit. The chronometer time of the sight is 03h 21m 12s, and the chronometer error is 01m 50s slow. The sextant altitude (hs) is 34°54.2'. The index error is 2.0' on the arc, and your height of eye is 45 feet. What is the latitude at meridian transit?

- (A) 41°12.0'N
- (B) 41°16.0'N
- (C) 41°20.2'N
- (D) 41°23.6'N

*If choice B is selected set score to 1.*
4. On 17 April your vessel is enroute from the Panama Canal to Kobe, Japan. Your 0400 zone time DR position is LAT 26°12.0'N, LONG 126°12.0'W. Your vessel is on course 285°T at a speed of 18 knots. What will be the zone time of sunrise at your vessel?

- (A) 0535
- (B) 0541
- (C) 0552
- (D) 0602

*If choice D is selected set score to 1.*

5. You are keeping ZD +4 on your vessel. On 21 June at 0906 DST, your position is LAT 30°48.0'N, LONG 71°00.0'W. You are on a course of 167°T at 15.2 knots. At what time will local apparent noon (LAN) occur ZT at your vessel? You are keeping DST.

- (A) 1145
- (B) 1202
- (C) 1218
- (D) 1245

*If choice D is selected set score to 1.*

6. On 2 October your 1845 DR position is LAT 28°09.2'S, LONG 167°48.1'E. You observe a faint star through a hole in the clouds at a sextant altitude (hs) of 63°29.1' bearing 237.5°T. The index error is 1.3' off the arc, and the height of eye is 42 feet. The chronometer reads 07h 46m 19s and is 0m 51s fast. What star did you observe?

- (A) Kappa Scorpii
- (B) Alpha Arae
- (C) Beta Draconis
- (D) Beta Ophiuchi

*If choice A is selected set score to 1.*

7. You desire to make good a true course of 132°. The variation is 10°W, magnetic compass deviation is 5°E, and gyrocompass error is 5°W. A northeast by east wind produces a 5° leeway. What is the course to steer per standard magnetic compass to make the true course good?

- (A) 142°psc
- (B) 135°psc
- (C) 137°psc
- (D) 132°psc

*If choice D is selected set score to 1.*
8. A vessel steams 720 miles on course 058°T from LAT 30°06.0'S, LONG 31°42.0'E. What are the latitude and longitude of the point of arrival by mid-latitude sailing?

- (A) LAT 23°44'S, LONG 43°07'E
- (B) LAT 23°48'S, LONG 43°11'E
- (C) LAT 23°34'S, LONG 43°00'E
- (D) LAT 23°38'S, LONG 43°03'E

If choice A is selected set score to 1.

9. The great circle distance from LAT 24°25.3'N, LONG 83°02.6'W to LAT 35°57.2'N, LONG 5°45.7'W is 3966.5 miles. Determine the latitude of the vertex.

- (A) 38°46.2'N
- (B) 38°16.4'N
- (C) 38°09.4'N
- (D) 37°57.3'N

If choice C is selected set score to 1.

10. On 10 June your 1712 zone time DR position is LAT 25°10.0' S, LONG 06°58.0' E. You are on course 213°T at a speed of 9.0 knots. Considering their magnitude, azimuth, and altitude, which group includes the three stars best suited for a fix at star time?

- (A) Procyon, Antares, Sirius
- (B) Acrux, Canopus, Regulus
- (C) Sirius, Procyon, Regulus
- (D) Acrux, Procyon, Arcturus

If choice D is selected set score to 1.

11. You are planning a voyage from departure Seattle (LAT 48°30'N, LONG 125°00'W) to a position at LAT 44°00'N, LONG 161°00'E. Which statement is TRUE? (Use gnomonic chart WOXZC 5270.)

- (A) You must plot a composite sailing to remain south of the Aleutians.
- (B) Military exercises north of 53°N, between 150°W and 165°W, will not affect your voyage.
- (C) At your highest latitude, the sun will be visible at upper and lower transit if the voyage occurs on 21 June.
- (D) The northern hemisphere vertex lies to the west of your arrival position.

If choice B is selected set score to 1.
12. On 7 March at 1838 ZT, in DR position LAT 34°26.9' N, LONG 58°16.2' W, you observe Polaris for latitude. The sextant altitude (hs) is 35°08.4'. The index error is 2.5' off the arc. The height of eye is 54 feet. What is the latitude at the time of the sight?

- (A) 34°29.8'N
- (B) 34°33.4'N
- (C) 34°34.8'N
- (D) 34°36.8'N

*If choice B is selected set score to 1.*

13. A great circle crosses the equator at 141°E. It will also cross the equator at what other longitude?

- (A) 39°W
- (B) 180°E
- (C) 141°W
- (D) 41°E

*If choice A is selected set score to 1.*

14. On 15 November your 1030 ZT DR position is LAT 19°41'S, LONG 41°37'W. You are on course 239°T, speed 22 knots. Determine your 1200 position using the following observations of the Sun.

<table>
<thead>
<tr>
<th>Zone Time</th>
<th>GHA</th>
<th>Declination</th>
<th>Ho</th>
</tr>
</thead>
<tbody>
<tr>
<td>1128</td>
<td>40°50.4'</td>
<td>S 18°33.6'</td>
<td>88°18.4'</td>
</tr>
<tr>
<td>1133</td>
<td>42°05.4'</td>
<td>S 18°33.6'</td>
<td>88°37.7'</td>
</tr>
</tbody>
</table>

- (A) LAT 20°01.0'S, LONG 42°05.9'W
- (B) LAT 20°04.3'S, LONG 42°09.8'W
- (C) LAT 20°06.7'S, LONG 42°06.1'W
- (D) LAT 20°08.1'S, LONG 42°00.7'W

*If choice A is selected set score to 1.*
15. On 4 July at 0630 ZT, morning stars were observed, and the vessel's position was determined to be LAT 21°15.0’S, LONG 21°20.0’W. Your vessel is steaming at 13.0 knots on a course of 146°T. A sextant observation of the Sun's lower limb is made at 0915 ZT. The chronometer reads 10h 14m 27s, and the sextant altitude is 25°29.8’. The index error is 3.1’ off the arc, and the chronometer error is 0m 53s slow. Your height of eye on the bridge is 48.0 feet. What is the azimuth (Zn) of this sight using the assumed position?

- (A) 049.5°T
  - (B) 052.6°T
  - (C) 054.3°T
  - (D) 058.9°T

*If choice A is selected set score to 1.*