

U.S.C.G. Merchant Marine Exam
Master/Chief Mate of Unlimited Tonnage
Q109 Navigation Problems - Oceans
(Sample Examination)

Choose the best answer to the following Multiple Choice questions.

1. On 17 May at 0501 zone time, morning stars were observed, and the vessel's position was determined to be LAT 22°16.0'S, LONG 103°46.0'W. Your vessel is steaming at 24.0 knots on a course of 301°T. A sextant observation of the Sun's lower limb is made at 0845 zone time. The chronometer reads 03h 43m 32s, and the sextant altitude is 28°24.7'. The index error is 1.5' off the arc, and the chronometer error is 02m 02s slow. Your height of eye on the bridge is 85.5 feet. What is the azimuth (Zn) of this sight using the assumed position?

- (A) 051.0°T
- (B) 052.5°T
- (C) 054.2°T
- (D) 055.7°T

If choice B is selected set score to 1.

2. On 26 September your 0830 zone time DR position is LAT 23°04.0'N, LONG 129°16.0'E. Your vessel is on course 119°T at a speed of 20.0 knots. What is the zone time of local apparent noon (LAN)?

- (A) 1158
- (B) 1205
- (C) 1210
- (D) 1214

If choice C is selected set score to 1.

3. 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.

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

- (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.

4. On 30 July your 1030 ZT DR position is LAT 17°46'N, LONG 139°30'W. You are on course 129°T, speed 24 knots. Determine your 1200 position using the following observations of the Sun.

Zone Time	GHA	Declination	Ho
1220	138°25.0'	N 18°22.3'	88°43.3'
1226	139°55.0'	N 18°22.2'	88°24.0'

- (A) LAT 17°24.0'N, LONG 138°59.8'W
- (B) LAT 17°21.6'N, LONG 138°56.2'W
- (C) LAT 17°18.7'N, LONG 139°07.6'W
- (D) LAT 17°15.1'N, LONG 139°00.0'W

If choice D is selected set score to 1.

5. Determine the great circle distance and initial course from LAT 35°08.0'S, LONG 19°26.0'E to LAT 33°16.0'S, LONG 115°36.0'E.

- (A) 4457 miles, 126°T
- (B) 4688 miles, 126°T
- (C) 4682 miles, 059°T
- (D) 4559 miles, 121°T

If choice D is selected set score to 1.

6. On 12 March your 1846 zone time DR position is LONG 129°16.5' W. At that time you observe Polaris with a sextant altitude (hs) of 28°01.5'. The chronometer time of the sight is 03h 44m 10s, and the chronometer error is 01m 55s slow. The index error is 2.2' off the arc, and the height of eye is 59.8 feet (18.2 m). What is your latitude by Polaris?

- (A) 27°33.7'N
- (B) 27°40.9'N
- (C) 27°54.4'N
- (D) 28°06.9'N

If choice A is selected set score to 1.

7. The true course between two points is 119°. Your gyrocompass has an error of 3°E. You allow of 4° leeway for a south-southwest wind. What gyro course should be steered to make the true course good?

- (A) 126°pgc
- (B) 112°pgc
- (C) 120°pgc
- (D) 118°pgc

If choice C is selected set score to 1.

8. You are planning a voyage by great circle to Reykjavik, Iceland, via Cape Race, Newfoundland, LAT 46°30'N, LONG 53°00'W. Which statement is TRUE? (Use gnomonic tracking chart WOXZC 5274)
- (A) The track line will be concave to Cape Farewell (Kap Farvel) when plotted on a Mercator chart.
 - (B) The distance is measured using the length of a degree of latitude at the mid-latitude and mid-longitude position.
 - (C) The Northern Hemisphere vertex is in the vicinity of 49°W longitude.
 - (D) You will reach the northernmost latitude in the vicinity of Reykjavik.

If choice D is selected set score to 1.

9. 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.

10. On 15 December in DR position LAT 23°24.0'N, LONG 55°36.0'W, you take an ex-meridian observation of the Sun's lower limb. The chronometer time of the sight is 03h 45m 19s, and the chronometer error is 00m 00s. The sextant altitude (hs) is 43°02.3'. The index error is 2.6' on the arc, and your height of eye is 65.0 feet. What is the latitude at meridian transit?
- (A) LAT 23°33.5'N
 - (B) LAT 23°35.8'N
 - (C) LAT 23°38.1'N
 - (D) LAT 23°40.6'N

If choice A is selected set score to 1.

11. On 11 November your 0200 zone time DR position is LAT 26°32' S, LONG 154°16' E. You are on course 058°T at a speed of 21 knots. Considering their magnitude, azimuth, and altitude, which group includes the three bodies best suited for a fix at star time?
- (A) Mars, Betelgeuse, Miaplacidus
 - (B) Polaris, Regulus, Rigel
 - (C) Saturn, Peacock, Rigel
 - (D) Jupiter, Spica, Canopus

If choice A is selected set score to 1.

12. You depart LAT $38^{\circ}12'S$, LONG $12^{\circ}06'W$ and steam 1543 miles on course 270° . What is the Longitude of arrival?

- (A) $44^{\circ}49'W$
- (B) $45^{\circ}37'W$
- (C) $45^{\circ}12'W$
- (D) $45^{\circ}42'W$

If choice A is selected set score to 1.

13. On 13 September your 1830 ZT DR position was LAT $23^{\circ}03'S$, LONG $105^{\circ}16'E$ when you observe a faint unidentifiable star through a hole in the clouds. The star bore $132.3^{\circ}T$ at a sextant altitude (hs) of $29^{\circ}34.6'$. The chronometer read 11h 24m 39s and is 5m 08s slow. The index error is 1.0' off the arc, and the height of eye is 52 feet. What star did you observe?

- (A) Sigma Capricorni
- (B) Scheat
- (C) Alpha Indi
- (D) Beta Gruis

If choice D is selected set score to 1.

14. On 21 April your 1542 zone time DR position is LAT $28^{\circ}54.0'S$, LONG $19^{\circ}07.0'W$. At that time, you observe the Sun bearing $299^{\circ}psc$. The chronometer reads 04h 44m 11s, and the chronometer error is 01m 54s fast. The variation is $3^{\circ}E$. What is the deviation of the standard compass?

- (A) $0.3^{\circ}W$
- (B) $0.4^{\circ}E$
- (C) $2.7^{\circ}W$
- (D) $2.7^{\circ}E$

If choice A is selected set score to 1.

15. On 13 February at 0325 zone time, your DR position is LAT $23^{\circ}20'N$, LONG $155^{\circ}15'W$. You are steering $240^{\circ}T$ at a speed of 13.6 knots. What is the zone time of sunrise?

- (A) 0652
- (B) 0657
- (C) 0706
- (D) 0711

If choice B is selected set score to 1.

***If assessment score is 80% to 100% Pass
If assessment score is 0% to 79% Fail***