

U.S.C.G. Merchant Marine Exam
Mate Offshore Supply Vessels
Q215 Navigation Problems – Oceans
(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions

1. You are steering 154° per gyrocompass. The wind is northeast by east, causing 4° leeway. The gyro error is 3° east, variation is 11° west, and deviation is 7° E. What is the true course made good?
- A. 164° T
 - B. 158° T
 - C. 151° T
 - D. 161° T

Correct answer: D

2. On 1 July your 0515 ZT fix gives you a position of LAT $24^\circ 36.0'S$, LONG $151^\circ 42.0'W$. Your vessel is on course 300° T, and your speed is 10.0 knots. Local apparent noon (LAN) occurs at 1215 ZT, at which time a meridian altitude of the Sun's lower limb is observed. The observed altitude (H_o) for this sight is $42^\circ 55.0'$. What is the calculated latitude at LAN?
- A. $24^\circ 03.6'S$
 - B. $24^\circ 02.5'S$
 - C. $24^\circ 01.0'S$
 - D. $24^\circ 00.0'S$

Correct answer: C

3. On 28 February your 1850 zone time DR position is LAT $27^\circ 49.0'N$, LONG $159^\circ 24.0'W$. Considering their magnitude, azimuth, and altitude, which group includes the three stars best suited for a fix at star time?
- A. Sirius, Mirfak, Elnath
 - B. Hamal, Alkaid, Canopus
 - C. Bellatrix, Vega, Regulus
 - D. Rigel, Schedar, Regulus

Correct answer: D

4. Determine the great circle distance and initial course from LAT $35^\circ 08.0'S$, LONG $19^\circ 26.0'E$ to LAT $33^\circ 16.0'S$, LONG $115^\circ 36.0'E$.
- A. 4682 miles, 059° T
 - B. 4457 miles, 126° T
 - C. 4688 miles, 126° T
 - D. 4559 miles, 121° T

Correct answer: D

5. On 6 December your 0800 zone time DR position was LAT 21°48.0'N, LONG 124°30.0'E. Your vessel was steaming on course 045°T at a speed of 20.0 knots. An observation of the Sun's lower limb was made at 1012 ZT. The chronometer read 02h 10m 42s and was slow 01m 02s. The observed altitude (Ho) was 41°17.1'. LAN occurred at 1129 zone time. The observed altitude (Ho) was 44°53.7'. What was the longitude of your 1200 zone time running fix?
- A. LONG 125°25.0'E
 - B. LONG 125°28.9'E
 - C. LONG 125°32.5'E
 - D. LONG 125°35.2'E

Correct answer: D

6. On 6 April your 0300 DR position is LAT 27°42'S, LONG 128°58'W. You are on course 097°T at a speed of 18 knots. You observed 3 celestial bodies. Determine the latitude and longitude of your 0600 running fix.

NP-0029

BODY	ZONE TIME	GHA	OBSERVED ALTITUDE (Ho)	DECLINATION
Fomalhaut	0530	203°08.6'	25°17.5'	S 29°43.4'
Rigil Kent.	0536	194°12.4'	35°26.6'	S 60°45.3'
Vega	0540	135°43.2'	23°06.8'	N 38°45.7'

- A. LAT 27°15.5'S, LONG 128°12.4'W
- B. LAT 27°44.7'S, LONG 127°47.5'W
- C. LAT 27°52.4'S, LONG 127°49.4'W
- D. LAT 28°15.2'S, LONG 128°11.6'W

Correct answer: B

7. On 22 February your 1857 DR position is LAT 23°46.0'S, LONG 93°16.5'E. You observe an unidentified star bearing 150°T at an observed altitude (Ho) of 42°15.0'. The chronometer reads 01h 00m 35s, and is 03m 25s fast. What star did you observe?
- A. Adhara
 - B. Suhail
 - C. Avior
 - D. Miaplacidus

Correct answer: C

8. On 13 August your 0345 ZT DR position is LAT 21°35.0'N, LONG 135°26.0'W. You are on course 052°T at a speed of 14 knots. What will be the zone time of sunrise at your vessel?
- A. 0443
 - B. 0449
 - C. 0536
 - D. 0540

Correct answer: C

9. On 12 April at 0515 ZT, morning stars were observed, and the vessel's position was determined to be LAT 21°05'S, LONG 16°30'W. Your vessel is steaming at 19 knots on a course of 278°T. A sextant observation of the Sun's lower limb is made at 0930 ZT. The chronometer reads 10h 28m 25s, and the sextant altitude (hs) is 40°15.9'. The index error is 2.5' off the arc, and the chronometer error is 2m 15s slow. Your height of eye on the bridge is 57 feet. What is the azimuth (Zn) and intercept (a) based on the assumed position of this sight?
- A. Zn 057.7°, a 15.4' T
 - B. Zn 057.0°, a 17.7' A
 - C. Zn 122.3°, a 17.7' A
 - D. Zn 123.0°, a 22.7' A

Correct answer: B

10. A vessel at LAT 07°05'N, LONG 81°45'W is to proceed to LAT 08°40'N, LONG 88°00'W. What are the course and distance by mid-latitude sailing?
- A. 285.6°T, 385.0 miles
 - B. 284.3°T, 384.6 miles
 - C. 283.1°T, 381.2 miles
 - D. 286.8°T, 387.4 miles

Correct answer: B

11. Determine the distance from LAT 63°54.0'N, LONG 04°52.0'E to LAT 63°54.0'N, LONG 18°24.0'W by parallel sailing.
- A. 608.6 miles
 - B. 610.9 miles
 - C. 612.3 miles
 - D. 614.2 miles

Correct answer: D

12. On 20 June your 0800 zone time DR position is LAT 21°02.0'N, LONG 152°50.0'E. Your vessel is on course 265°T at a speed of 15.0 knots. What is the zone time of local apparent noon (LAN)?
- A. 1149
 - B. 1154
 - C. 1159
 - D. 1203

Correct answer: B

13. At 0915 ZT on 26 July you depart Yokohama, LAT 35°27.0'N, LONG 139°39.0'E (ZD -9). You are bound for Seattle, LAT 47°36.0'N, LONG 122°22.0'W, and you estimate your speed of advance at 14 knots. The distance is 4,245 miles. What is your estimated ZT of arrival at Seattle?
- A. 0728, 7 August
 - B. 1528, 7 August
 - C. 0028, 8 August
 - D. 1528, 8 August

Correct answer: A

14. On 29 April your 1913 zone time DR position is LAT $22^{\circ}09.0'N$, LONG $56^{\circ}16.0'W$. At that time you observe Polaris with a sextant altitude (hs) of $22^{\circ}25.8'$. The chronometer time of the sight is 11h 11m 14s, and the chronometer error is 02m 18s slow. The index error is 1.5' off the arc, and the height of eye is 61.5 feet. What is your latitude by Polaris?
- A. $21^{\circ}39.9'N$
 - B. $21^{\circ}55.7'N$
 - C. $22^{\circ}39.9'N$
 - D. $22^{\circ}48.8'N$

Correct answer: C

15. On 3 October your 0330 zone time (ZD + 5) DR position is LAT $47^{\circ}41'N$, LONG $86^{\circ}49'W$. At that time, you observe Polaris bearing $357.5^{\circ}pgc$. The chronometer time of the observation is 08h 32m 04s, and the chronometer is 0m 27s slow. The variation is $5.5^{\circ}W$. What is the gyro error?
- A. $7.5^{\circ}E$
 - B. $5.0^{\circ}E$
 - C. $3.5^{\circ}E$
 - D. $2.0^{\circ}E$

Correct answer: D