

U.S.C.G. Merchant Marine Exam
Second/Third Mate Unlimited Tonnage
Q117 Navigation Problems - Oceans
(Sample Examination)

Choose the best answer to the following Multiple Choice questions.

1. On 19 November your 0200 zone time DR position is LAT 18°41' N, LONG 150°37' E. You are on course 014°T at a speed of 18 knots. You observed 3 celestial bodies. Determine the latitude and longitude of your 0600 running fix.

Body	Zone Time	GHA	Observed Altitude	Declination
Rigel	0558	238°11.2'	38°39.5'	S 08°13.2'
Capella	0600	238°16.1'	55°15.1'	N 45°58.7'
Denebola	0604	141°05.0'	33°39.8'	N 14°40.6'

- (A) LAT 19°42.8'N, LONG 150°56.9'E
- (B) LAT 19°41.2'N, LONG 150°46.3'E
- (C) LAT 19°45.4'N, LONG 150°52.6'E
- (D) LAT 19°39.3'N, LONG 150°51.8'E

If choice C is selected set score to 1.

2. At 0600 ZT on 24 July your DR position is LAT 22°37'N, LONG 32°45'W. You are steering 185°T at a speed of 20.0 knots. Determine the computed altitude (Hc) and azimuth (Zn) for an observation of the Sun's lower limb taken at 1030 ZT. At this time the chronometer reads 00h 30m 16s and is 0m 31s slow.

- (A) Hc 64°27.5' Zn 092.3°
- (B) Hc 64°30.8' Zn 090.1°
- (C) Hc 64°41.7' Zn 087.8°
- (D) Hc 64°44.2' Zn 094.7°

If choice C is selected set score to 1.

3. On 17 May your 0300 ZT DR position is LAT 27°21.0'N, LONG 146°14.0'E. You are on course 107°T at a speed of 18 knots. What will be the zone time of sunrise at your vessel?

- (A) 0511
- (B) 0522
- (C) 0457
- (D) 0519

If choice B is selected set score to 1.

4. Determine the great circle distance and initial course from LAT $31^{\circ}57.0'S$, LONG $115^{\circ}52.0'E$ to LAT $24^{\circ}47.0'N$, LONG $66^{\circ}59.0'E$.
- (A) 4516 miles, $134.5^{\circ}T$
 - (B) 4402 miles, $319.5^{\circ}T$
 - (C) 4378 miles, $336.8^{\circ}T$
 - (D) 4407 miles, $314.5^{\circ}T$

If choice D is selected set score to 1.

5. A vessel at LAT $14^{\circ}10'N$, LONG $61^{\circ}00'W$ is to proceed to LAT $10^{\circ}00'N$, LONG $53^{\circ}23'W$. What is the course and distance by mid-latitude sailing?
- (A) $117.3^{\circ}T$, 503.0 miles
 - (B) $119.2^{\circ}T$, 512.0 miles
 - (C) $118.6^{\circ}T$, 508.0 miles
 - (D) $117.9^{\circ}T$, 504.0 miles

If choice B is selected set score to 1.

6. You depart LAT $38^{\circ}14'N$, LONG $12^{\circ}42'W$, for LAT $38^{\circ}14'N$, LONG $46^{\circ}09'W$. What are the course and distance by parallel sailing?
- (A) $090^{\circ}T$, 2879.0 miles
 - (B) $090^{\circ}T$, 1576.5 miles
 - (C) $270^{\circ}T$, 1576.5 miles
 - (D) $270^{\circ}T$, 2868.5 miles

If choice C is selected set score to 1.

7. On 10 October your 1500 zone time DR position is LAT $27^{\circ}35.6' S$, LONG $44^{\circ}49.0' W$. You are on course $342^{\circ}T$ at a speed of 24 knots. Considering their magnitude, azimuth, and altitude, which group includes the three bodies best suited for a fix at star time?
- (A) Venus, Arcturus, Hamal
 - (B) Moon, Al Na'ir, Rigil Kentaurus
 - (C) Deneb, Spica, Markab
 - (D) Venus, Moon, Fomalhaut

If choice B is selected set score to 1.

8. On 17 March your 0520 DR position is LAT $27^{\circ}23.0'N$, LONG $39^{\circ}42.0'W$. You observe an unidentified star bearing $313^{\circ}T$ at an observed altitude (H_o) of $43^{\circ}03.8'$. The chronometer reads 08h 22m 15s and is 01m 45s fast. What star did you observe?
- (A) Arcturus
 - (B) Altair
 - (C) Deneb
 - (D) Alkaid

If choice D is selected set score to 1.

9. On 28 July your 0800 zone time (ZT) fix gives you a position of LAT $25^{\circ}16.0'N$, LONG $71^{\circ}19.0'W$. Your vessel is on course $026^{\circ}T$, and your speed is 17.5 knots. Local apparent noon (LAN) occurs at 1150 ZT, at which time a meridian altitude of the Sun's lower limb is observed. The observed altitude (H_o) for this sight is $82^{\circ}28.7'$. What is the latitude at 1200 ZT?
- (A) $26^{\circ}32.0'N$
 - (B) $26^{\circ}25.0'N$
 - (C) $26^{\circ}27.6'N$
 - (D) $26^{\circ}29.8'N$

If choice C is selected set score to 1.

10. 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 (h_s) 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) $22^{\circ}48.8'N$
 - (B) $21^{\circ}39.9'N$
 - (C) $22^{\circ}39.9'N$
 - (D) $21^{\circ}55.7'N$

If choice C is selected set score to 1.

11. On 6 December your 0800 zone time DR position was LAT $21^{\circ}48.0'N$, LONG $124^{\circ}30.0'E$. Your vessel was steaming on course $045^{\circ}T$ 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 (H_o) was $41^{\circ}17.1'$. LAN occurred at 1129 zone time. The observed altitude (H_o) was $44^{\circ}53.7'$. What was the longitude of your 1200 zone time running fix?
- (A) LONG $125^{\circ}32.5'E$
 - (B) LONG $125^{\circ}25.0'E$
 - (C) LONG $125^{\circ}28.9'E$
 - (D) LONG $125^{\circ}35.2'E$

If choice D is selected set score to 1.

12. On 26 September your 0830 zone time DR position is LAT $26^{\circ}04.0'N$, LONG $129^{\circ}16.0'W$. Your vessel is on course $119^{\circ}T$ at a speed of 20.0 knots. What is the zone time of local apparent noon (LAN)?

- (A) 1133
- (B) 1130
- (C) 1124
- (D) 1127

If choice C is selected set score to 1.

13. While underway you sight a light 11° on your port bow at a distance of 12 miles. Assuming you make good your course, what will be your distance off the light when abeam?

- (A) 4.5 miles
- (B) 2.3 miles
- (C) 3.9 miles
- (D) 3.1 miles

If choice B is selected set score to 1.

14. Your vessel is steering course $299^{\circ}psc$, variation for the area is $7^{\circ}W$, and deviation is $4^{\circ}W$. The wind is from the southwest, producing a 3° leeway. What true course are you making good?

- (A) $291^{\circ}T$
- (B) $299^{\circ}T$
- (C) $296^{\circ}T$
- (D) $313^{\circ}T$

If choice A is selected set score to 1.

15. On 7 December your 0350 ZT position is LAT $35^{\circ}42'N$, LONG $17^{\circ}38'E$. You observe Polaris bearing $359.7^{\circ}pgc$. At the time of the observation the helmsman noted that he was heading $016^{\circ}pgc$ and $014^{\circ}psc$. The variation is $1^{\circ}E$. What is the deviation for that heading?

- (A) $0.3^{\circ}E$
- (B) $1.5^{\circ}E$
- (C) $0.3^{\circ}W$
- (D) $1.5^{\circ}W$

If choice A is selected set score to 1.