

U.S.C.G. Merchant Marine Exam
Master/Chief Mate Offshore Supply Vessels
Q207 Navigation Problems - Oceans
(Sample Examination)

Choose the best answer to the following Multiple Choice questions.

1. On 26 July your 1030 ZT DR position is LAT 18°25'N, LONG 51°15'W. You are on course 231°T, speed 15 knots. Determine your 1200 position using the following observations of the Sun.

<u>ZT</u>	<u>GHA</u>	<u>DECLINATION</u>	<u>Ho</u>
1228	50°23.5'	N 19°21.9'	88°14.3'
1236	52°23.5'	N 19°21.8'	88°29.0'

- (A) LAT 18°00.9'N, LONG 51°31.9'W
- (B) LAT 18°07.2'N, LONG 51°30.4'W
- (C) LAT 18°10.6'N, LONG 51°25.1'W
- (D) LAT 18°03.5'N, LONG 51°36.2'W

If choice B is selected set score to 1.

2. On 3 December evening twilight for your vessel will occur at 1901 zone time. Your vessel's DR position will be LAT 24°18.5' S, LONG 110°30.6' W. Considering their magnitude and location, what are the three stars best suited to observe for a fix at star time?

- (A) Rigel, Canopus, Regulus
- (B) Antares, Fomalhaut, Mirfak
- (C) Alpheratz, Achernar, Nunki
- (D) Canopus, Hamal, Deneb

If choice C is selected set score to 1.

3. Except for N-S courses, and E-W courses on the equator, a great circle track between two points, when compared to a rhumb line track between the same two points, will _____.

- (A) always be nearer to the equator
- (B) be nearer to the pole or the equator depending on the latitudes of the arrival and departure positions
- (C) always be nearer to the elevated pole
- (D) be nearer to the pole in the Northern Hemisphere and nearer to the equator in the Southern Hemisphere

If choice C is selected set score to 1.

4. You observe the lower limb of the Sun at a sextant altitude (hs) of $45^{\circ}49.7'$ on 13 November. The index error is 1.0' on the arc. The height of eye is 61 feet (18.6 meters). What is the observed altitude (H_o)?
- (A) $45^{\circ}49.8'$
 - (B) $45^{\circ}52.9'$
 - (C) $45^{\circ}56.4'$
 - (D) $45^{\circ}59.3'$

If choice C is selected set score to 1.

5. You depart LAT $50^{\circ}06.0'N$, LONG $153^{\circ}06.0'E$ and steam 879 miles on course 090° . What is the LONG of arrival?
- (A) $178^{\circ}36.0'W$
 - (B) $175^{\circ}56.0'E$
 - (C) $177^{\circ}24.0'E$
 - (D) $175^{\circ}04.0'W$

If choice B is selected set score to 1.

6. On 12 June your 1845 DR position is LAT $21^{\circ}47'N$, LONG $46^{\circ}52'W$ when you observe a faint unidentifiable star through a break in the clouds. The star bears $174.0^{\circ}T$ at a sextant altitude (hs) of $18^{\circ}58.6'$. The index error is 0.5' on the arc, and the height of eye is 45 feet. The chronometer reads 09h 43m 27s, and the chronometer error is 1m 46s slow. What star did you observe?
- (A) Muhlifain
 - (B) Alpha Hydri
 - (C) Alpha Muscae
 - (D) Almak

If choice A is selected set score to 1.

7. On 18 November your 1750 zone time DR position is LONG $110^{\circ}16.0'W$. At that time you observe Polaris with a sextant altitude (hs) of $21^{\circ}29.8'$. The chronometer time of the sight is 00h 52m 43s, and the chronometer error is 02m 18s fast. The index error is 3.2' on the arc, and the height of eye is 49.5 feet. What is your latitude by Polaris?
- (A) $21^{\circ}28.1'N$
 - (B) $21^{\circ}03.4'N$
 - (C) $21^{\circ}35.1'N$
 - (D) $21^{\circ}13.4'N$

If choice B 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) You will reach the northernmost latitude in the vicinity of Reykjavik.
 - (C) The Northern Hemisphere vertex is in the vicinity of 49°W longitude.
 - (D) The distance is measured using the length of a degree of latitude at the mid-latitude and mid-longitude position.

If choice B is selected set score to 1.

9. Determine the great circle distance and initial course from LAT 34°51.0'N, LONG 115°01.2'E to LAT 10°16.0'S, LONG 51°42.6'E.
- (A) 4582 miles, 245.6°T
 - (B) 4436 miles, 245.3°T
 - (C) 4598 miles, 245.6°T
 - (D) 4493 miles, 245.6°T

If choice D is selected set score to 1.

10. On 22 November your vessel is enroute from Accra, Ghana to Montevideo, Uruguay. You are on course 240°T and making a speed of 15.0 knots. Your 1129 DR position is LAT 28°25.0' S, LONG 42°40.0' W. You observed 3 celestial bodies. Determine the latitude and longitude of your 1137 running fix.

Body	Zone Time	GHA	Observed Altitude	Declination
Venus	1129	350°00.1'	43°26.8'	S 25°41.8'
Moon	1134	082°54.7'	43°15.0'	S 01°46.5'
Sun	1137	042°38.0'	81°44.7'	S 20°11.7'

- (A) LAT 28°23.4'S, LONG 42°42.0'W
- (B) LAT 28°25.2'S, LONG 42°40.0'W
- (C) LAT 28°25.0'S, LONG 42°36.0'W
- (D) LAT 28°27.0'S, LONG 42°38.0'W

If choice D is selected set score to 1.

11. On 24 January your 0700 zone time DR position is LAT 22°25.0'N, LONG 46°10.0'W. Your vessel is on course 110°T at a speed of 12.0 knots. What is the zone time of local apparent noon (LAN)?

- (A) 1212
- (B) 1215
- (C) 1203
- (D) 1208

If choice A is selected set score to 1.

12. On 1 November your 1600 zone time DR position is LAT 27°48'S, LONG 91°26'E. Your vessel is on a course of 327° T at a speed of 16 knots. What will be the zone time of sunset at your vessel?

- (A) 1829
- (B) 1813
- (C) 1821
- (D) 1836

If choice B is selected set score to 1.

13. You desire to make good a true course of 174°. The variation is 17°W, magnetic compass deviation is 4°W, and gyrocompass error is 4°E. A west-southwest wind produces a 4° leeway. What is the course to steer per standard magnetic compass to make the true course good?

- (A) 197°psc
- (B) 195°psc
- (C) 203°psc
- (D) 199°psc

If choice D is selected set score to 1.

14. On 5 May in DR position LAT 38°34.5'N, LONG 124°20.7'W, you take an ex-meridian observation of the Sun's lower limb. The chronometer time of the sight is 07h 59m 10s, and the chronometer error is 01m 10s slow. The sextant altitude (hs) is 67°27.0'. The index error is 1.4' on the arc, and your height of eye is 30 feet. What is the latitude at meridian transit?

- (A) LAT 38°26.4'N
- (B) LAT 38°30.2'N
- (C) LAT 38°36.0'N
- (D) LAT 38°41.2'N

If choice C is selected set score to 1.

- 15.** On 1 September your 1115 zone time DR position is LAT 25°20.0'N, LONG 28°24.0'W.
At that time, you observe the Sun bearing 160.5°psc.
The chronometer reads 01h 14m 58s, and the chronometer error is 01m 17s fast.
The variation is 13.5°W.

What is the deviation of the standard compass?

- (A) 11.0°E
- (B) 2.1°E
- (C) 4.1°E
- (D) 11.0°W

If choice B is selected set score to 1.