

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. 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. 4682 miles, 059°T
 - B. 4559 miles, 121°T
 - C. 4688 miles, 126°T
 - D. 4457 miles, 126°T

Correct answer: B

2. On 7 November your 0830 zone time fix gives you a position of LAT 27°36.0'N, LONG 163°19.0'W. Your vessel is on course 289°T, and your speed is 19.0 knots. Local apparent noon (LAN) occurs at 1138 zone time, at which time a meridian altitude of the Sun's lower limb is observed. The observed altitude (H_o) for this sight is 45°35.0'. What is the calculated latitude at LAN?
- A. 27°52.3'N
 - B. 27°53.4'N
 - C. 27°55.1'N
 - D. 27°57.2'N

Correct answer: D

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

Correct answer: A

4. Your vessel is steering course 027° per standard magnetic compass (psc), variation for the area is 19°W, and deviation is 2°E. The wind is from the north-northwest, producing a 5° leeway. What true course are you making good?
- A. 005°T
 - B. 049°T
 - C. 015°T
 - D. 044°T

Correct answer: C

5. On 13 February at 0325 zone time, your DR position is LAT 23°20'N, LONG 155°15'W. You are steering 240°T at a speed of 13.6 knots. What is the zone time of sunrise?
- A. 0652
 - B. 0657
 - C. 0706
 - D. 0711

Correct answer: B

6. For navigational purposes, each great circle on the Earth has a length of _____.
- A. 3,600 miles
 - B. 5,400 miles
 - C. 12,500 miles
 - D. 21,600 miles

Correct answer: D

7. 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 distance is measured using the length of a degree of latitude at the mid-latitude and mid-longitude position.
 - B. The Northern Hemisphere vertex is in the vicinity of 49°W longitude.
 - C. You will reach the northernmost latitude in the vicinity of Reykjavik.
 - D. The track line will be concave to Cape Farewell (Kap Farvel) when plotted on a Mercator chart.

Correct answer: C

8. On 10 July your 0930 zone time DR position is LAT 26°31.0'S, LONG 4°41.0'E. Your vessel is on course 308°T at a speed of 22.0 knots. What is the zone time of local apparent noon (LAN)?
- A. 1144
 - B. 1149
 - C. 1153
 - D. 1159

Correct answer: B

9. On 2 October your 1845 DR position was 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 20°45.6' T, bearing 201.5°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 00m 51s fast. What star did you observe?
- A. Beta Corvi
 - B. Muhlifain
 - C. Cor Caroli
 - D. Alpha Muscae

Correct answer: D

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

Correct answer: B

11. You observe the lower limb of the Sun at a sextant altitude (hs) of $41^{\circ}29.8'$ on 11 January. The index error is 2.4' off the arc. The height of eye is 68 feet. What is the observed altitude (H_o)?
- A. $41^{\circ}36.4'$
 - B. $41^{\circ}39.4'$
 - C. $41^{\circ}42.0'$
 - D. $41^{\circ}44.5'$

Correct answer: B

12. On September 9 your 2130 zone time (ZD +5) DR position is LAT $45^{\circ}08'N$, LONG $82^{\circ}38'W$. At that time, you observe Polaris bearing $000.5^{\circ}pgc$. The chronometer time of the observation is 02h 26m 09s, and the chronometer is 1m 43s slow. The variation is $8.7^{\circ}W$. What is the gyro error?
- A. $0.7^{\circ}E$
 - B. $1.2^{\circ}E$
 - C. $0.8^{\circ}W$
 - D. $9.4^{\circ}W$

Correct answer: A

13. On 14 March at 1845 ZT, you take a sextant observation of Polaris. Your DR position is LAT $29^{\circ}10'N$, LONG $154^{\circ}30'W$, and your sextant reads $29^{\circ}53.5'$. Your chronometer reads 04h 42m 36s, and the chronometer error is 02m 24s slow. Your height of eye is 24 feet, and the index error is 1.3' off the arc. Determine the latitude by Polaris.
- A. $29^{\circ}11.7'N$
 - B. $29^{\circ}15.5'N$
 - C. $29^{\circ}18.0'N$
 - D. $29^{\circ}21.3'N$

Correct answer: D

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

NP-0012				
BODY	ZONE TIME	GHA	OBSERVED ALTITUDE (H_o)	DECLINATION
Moon	1030	$259^{\circ}24.4'$	$34^{\circ}01.5'$	N $9^{\circ}47.3'$
Sun	1116	$202^{\circ}30.5'$	$43^{\circ}00.0'$	S $19^{\circ}38.0'$
Venus	1200	$162^{\circ}57.7'$	$24^{\circ}26.9'$	S $26^{\circ}02.4'$

- A. LAT $27^{\circ}16.8'N$, LONG $157^{\circ}30.5'E$
- B. LAT $27^{\circ}22.6'N$, LONG $157^{\circ}37.8'E$
- C. LAT $27^{\circ}29.7'N$, LONG $157^{\circ}43.0'E$
- D. LAT $27^{\circ}33.4'N$, LONG $157^{\circ}48.2'E$

Correct answer: C

15. On 15 November your 1030 ZT DR position is LAT 17°25'S, LONG 42°12'W. You are on course 059°T, speed 22 knots. Determine your 1200 position using the following observations of the Sun.

NP-0103

Zone Time	GHA	Declination	Ho
1128	40°50.4'	S 18°33.6'	88°18.4'
1133	42°05.4'	S 18°33.6'	88°37.7'

- A. LAT 17°00.0'S, LONG 41°45.8'W
- B. LAT 17°02.1'S, LONG 41°48.4'W
- C. LAT 17°06.8'S, LONG 41°44.3'W
- D. LAT 17°08.9'S, LONG 41°40.4'W

Correct answer: C