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. You desire to make good a true course of 203°. The variation is 19°E, magnetic compass deviation is 2°W, and gyrocompass error is 1°E. A westerly wind produces a 3° leeway. What is the course to steer per standard magnetic compass to make the true course good?

   A. 189°psc
   B. 223°psc
   C. 210°psc
   D. 183°psc

   Correct answer: A

2. 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

3. On 3 May your 1009 zone time DR position is LAT 30°01.0'N, LONG 123°15.0'W. Your vessel is on course 330°T at a speed of 8.6 knots. What is the zone time of local apparent noon (LAN)?

   A. 1206
   B. 1208
   C. 1211
   D. 1214

   Correct answer: C

4. 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. Alpheratz, Achernar, Nunki
   B. Canopus, Hamal, Deneb
   C. Antares, Fomalhaut, Mirfak
   D. Rigel, Canopus, Regulus

   Correct answer: A

5. Determine the great circle distance and initial course from LAT 08°36.0'N, LONG 126°17.0'E to LAT 02°12.0'S, LONG 81°53.0'W.

   A. 9015 miles, 067°T
   B. 9076 miles, 067°T
   C. 9076 miles, 079°T
   D. 9105 miles, 079°T

   Correct answer: C

6. On 4 October your 1907 zone time DR position is LAT 25°15.0'S, LONG 105°44.0'E. At that time, you observe Deneb bearing 011.5°psc. The chronometer reads 00h 07m 42s, and the chronometer error is 00m 36s fast. The variation is 7.5°W. What is the deviation of the standard compass?

   A. 3.2°E
   B. 4.3°W
   C. 2.1°E
   D. 2.1°W

   Correct answer: A

7. On a voyage via the southern tip of Nova Scotia (LAT 43°20'N, LONG 65°35'W) you wish to sail the shortest route to La Coruna, Spain (LAT 43°20'N, LONG 8°24'W). Which of the following will require you to plot a composite sailing? (Use gnomonic tracking chart WOXZC 5274)

   A. Sea ice reported 68 miles ESE of St. John's, Newfoundland
   B. Icebergs reported extending west to west-northwest from LAT 47°00'N, LONG 35°00'W
   C. Shoals extending 15 miles from Sable Island
   D. Naval exercises using live ammunition being conducted within a 150 mile radius of LAT 49°00'N, LONG 20°00'W

   Correct answer: B

8. On 18 October your 1330 ZT DR position is LAT 27°32.0'N, LONG 154°47.0'W. You are on course 115°T at a speed of 20 knots. What will be the zone time of sunset at your vessel?

   A. 1715
   B. 1729
   C. 1742
   D. 1751

   Correct answer: C

9. Determine the distance from LAT 19°54.0'N, LONG 166°36.0'E to LAT 19°54.0'N, LONG 157°54.0'W, by parallel sailing.

   A. 2204.6 miles
   B. 2006.9 miles
   C. 2002.8 miles
   D. 1990.6 miles

   Correct answer: C

10. On 2 October your 1845 DR position is 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 11°37.6' bearing 066°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 0m 51s fast. What star did you observe?

    A. Scheat
    B. Ruckbah
    C. Caph
    D. Algenib

    Correct answer: D

11. On 17 December your 0600 ZT fix gives you a position of LAT 27°16.7'N, LONG 138°39.2'W. Your vessel is on course 137°T, and your speed is 14.8 knots. Local apparent noon (LAN) occurs at 1207 ZT, at which time a meridian altitude of the Sun's lower limb is observed. The observed altitude (Ho) for this sight is 40°22.1'. What is the calculated latitude at LAN?

    A. 26°09.9'N
    B. 26°11.6'N
    C. 26°13.0'N
    D. 26°15.4'N

    Correct answer: D

12. 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.

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BODY	ZONE TIME	GHA	OBSERVED ALTITUDE (Ho)	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'

    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

    Correct answer: C

13. 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°

    Correct answer: C

14. On 14 March at 1845 ZT, you take a sextant observation of Polaris. Your DR position is LAT 29°10'N, LONG 154°30'W, and your sextant reads 29°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°11.7'N
    B. 29°15.5'N
    C. 29°18.0'N
    D. 29°21.3'N

    Correct answer: D

15. A great circle crosses the equator at 141°E. It will also cross the equator at what other longitude?

    A. 141°W
    B. 180°E
    C. 39°W
    D. 41°E

    Correct answer: C