Keep 'em Safe, Keep 'em Sailing



## U.S.C.G. Merchant Marine Exam

## Mate Less than 500-1600 Gross Registered Tons

## Q142 Navigation Problems – Oceans

(Sample Examination)

## Choose the best answer to the following Multiple-Choice questions.

- On 29 June your 0800 zone time fix gives you a position of LAT 26°16.0'S, LONG 61°04.0'E. Your vessel is steaming a course of 079°T at a speed of 15.5 knots. An observation of the Sun's upper limb is made at 0905 zone time, and the observed altitude (Ho) is 25°20.1. The chronometer reads 05h 08m 12s, and the chronometer error is 02m 27s fast. Local apparent noon occurs at 1154 zone time, and a meridian altitude of the Sun's lower limb is made. The observed altitude (Ho) for this sight is 40°44.2'. Determine the vessel's 1200 zone time position.
  - A. LAT 26°02.0'S, LONG 62°05.0'E
  - B. LAT 26°02.0'S, LONG 62°23.2'E
  - C. LAT 26°05.1'S, LONG 62°06.3'E
  - D. LAT 25°56.0'S, LONG 62°03.0'E

Correct answer: A

- 2. On 10 October your 1500 zone time DR position is LAT 27°35.6'S, LONG 44°49.0'W. You are on course 342°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. Moon, Al Na'ir, Rigil Kentaurus
  - B. Venus, Moon, Fomalhaut
  - C. Deneb, Spica, Markab
  - D. Venus, Arcturus, Hamal

Correct answer: A

- 3. A vessel at LAT 20°00'N, LONG 107°30'W is to proceed to LAT 24°40'N, LONG 112°30'W. What is the course and distance by mid-latitude sailing?
  - A. 315.3°T, 394.0 miles
  - B. 317.2°T, 397.0 miles
  - C. 314.0°T. 389.0 miles
  - D. 318.3°T, 399.0 miles

Correct answer: A

- 4. The great circle distance from LAT 38°17'N, LONG 123°16'W to LAT 35°01'N, LONG 142°21'E is 4330 miles, and the initial course is 300.9°T. Determine the latitude of the vertex.
  - A. 47°35.2'N
  - B. 47°40.5'N
  - C. 47°24.7'N
  - D. 46°54.8'N

Correct answer: B

- 5. On 29 April your 1913 zone time DR position is LAT 22°09.0'N, LONG 56°16.0'W. At that time, you observe Polaris with a sextant altitude (hs) of 22°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°39.9'N
  - B. 21°55.7'N
  - C. 22°39.9'N
  - D. 22°48.8'N

Correct answer: C

- 6. You are steering 115°T, and a light is picked up dead ahead at a distance of 16.7 miles at 0522. You change course to pass the light 3.5 miles off abeam to port. If you are making 12 knots, what is your ETA at the position 3.5 miles off the light?
  - A. 0650
  - B. 0647
  - C. 0653
  - D. 0644

Correct answer: D

 On 25 March your 0500 ZT DR position is LAT 28°14.0'S, LONG 93°17.0'E. You are on course 291°T at a speed of 16.0 knots. You observed 3 celestial bodies. Determine the latitude and longitude of your 0550 running fix.

NP-0006				
BODY	ZONE TIME	GHA	OBSERVED ALTITUDE (Ho)	DECLINATION
Peacock	0520	226°18.5'	49°42.9'	S 56°47.6'
Altair	0535	238°38.2'	43°53.1'	N 8°48.9'
Spica	0550	338°48.5'	21°11.7'	S 11°03.8'

A. LAT 28°15.9'S, LONG 92°56.9'E

- B. LAT 28°19.3'S, LONG 92°59.0'E
- C. LAT 28°06.4'S, LONG 93°02.5'E
- D. LAT 27°53.2'S, LONG 93°17.6'E

Correct answer: A

- On 8 April your evening DR position is LAT 22°16.0' N, LONG 157°58.3' W. You observe an unidentified star bearing 238°T at an observed altitude (Ho) of 50°02.7'. The chronometer reads 05h 09m 57s, and is 01m 23s slow. What star did you observe?
  - A. Alnilam
  - B. Betelgeuse
  - C. Aldebaran
  - D. Bellatrix

Correct answer: A

- 9. On 25 December your 0330 ZT DR position is LAT 25°15.0'N, LONG 32°16.0'W. You are on course 145°T at a speed of 20 knots. What will be the zone time of sunrise at your vessel?
  - A. 0623
  - B. 0635
  - C. 0641
  - D. 0647

Correct answer: D

- 10. You observe the lower limb of the Sun at a sextant altitude (hs) of 38°07.5' on 8 August. The index error is 5.2' off the arc. The height of eye is 72 feet (22 meters). What is the observed altitude (Ho)?
  - A. 38°08.4'
  - B. 38°13.3'
  - C. 38°19.2'
  - D. 38°23.4'

Correct answer: C

- 11. 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

- 12. On 30 July, your 0200 zone time (ZD +4) DR position is LAT 43°48'N, LONG 78°00'W. At that time, you observe Polaris bearing 008.7°psc. The chronometer time of the observation is 05h 58m 07s, and the chronometer is 0m 23s slow. The variation is 10.5°W. What is the deviation of the magnetic compass?
  - A. 0.5°E
  - B. 3.0°E
  - C. 7.5°W
  - D. 18.0°W

Correct answer: B

- 13. On 14 October your 0800 zone time (ZT) dead reckoning position is LAT 28°22.0'N, LONG 161°17.0'E. Your vessel is on course 116°T at a speed of 17.5 knots. What is the ZT of local apparent noon (LAN)?
  - A. 1148

  - B. 1151C. 1156
  - D. 1202

Correct answer: C

- 14. You are steaming on course 126°T at 14.8 knots. At 1022 you sight a buoy bearing 128°T, at a range of 4.8 miles. If you change course at 1026, what true course will you steer to leave the buoy 0.5 mile abeam to port?
  - A. 133°
  - B. 119°
  - C. 136° D. 122°

Correct answer: C

- 15. On 7 November your 0830 zone time fix gives you a position of LAT 27°36.0'N, LONG 162°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 (Ho) for this sight is 45°35.0'. What is the latitude at 1200 ZT?
  - A. 27°55.1'N
  - B. 27°57.2'N
  - C. 27°59.5'N
  - D. 28°01.9'N

Correct answer: C