

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

### Master or Mate Less than 200 Gross Registered Tons

#### Q154 Navigation Problems – Oceans

#### (Sample Examination)

**Choose the best answer to the following Multiple Choice Questions.**

1. A sidereal day is approximately how much shorter than a solar day?

- (A) 4 minutes
- (B) 8 minutes
- (C) 12 minutes
- (D) 16 minutes

*If choice A is selected set score to 1.*

2. At 0600 zone time, on 16 March your DR position is LAT 20°10.0'N, LONG 81°30.0'W. You are steering course 300°T. The speed over the ground is 10 knots. You observed 3 morning sun lines. Determine the latitude and longitude of your 1130 running fix.

Zone Time	GHA	Observed Altitude	Declination
0800	12°50.0'	19°00.0'	S 01°38.8'
1030	50°20.4'	51°42.0'	S 01°36.5'
1130	65°20.5'	62°11.5'	S 01°35.5'

- (A) LAT 20°28.5'N, LONG 82°12.6'W
- (B) LAT 20°32.0'N, LONG 82°16.4'W
- (C) LAT 20°39.0'N, LONG 82°22.9'W
- (D) LAT 20°42.5'N, LONG 82°26.2'W

*If choice C is selected set score to 1.*

3. On 16 February your 1845 ZT DR position is LAT 25°50.5' N, LONG 46°24.0' W. At that time you observe Polaris with a sextant altitude (hs) of 26°25.5'. The chronometer time of the sight is 09h 47m 30s and the chronometer error is 02m 16s fast. The index error is 2.5' off the arc, and the height of eye is 55.0 feet. What is your latitude by Polaris?

- (A) 25°38.0'N
- (B) 25°44.2'N
- (C) 26°00.1'N
- (D) 26°37.5'N

*If choice A is selected set score to 1.*

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U.S.C.G. Merchant Marine Exam  
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Illustrations: 0

4. You are on course  $138^{\circ}\text{T}$ . To check the latitude of your vessel you should observe a celestial body on which bearing?
- (A)  $270^{\circ}$
  - (B)  $318^{\circ}$
  - (C)  $138^{\circ}$
  - (D)  $000^{\circ}$

*If choice D is selected set score to 1.*

5. On 17 April your vessel is enroute from the Panama Canal to Kobe, Japan. Your 0400 zone time DR position is LAT  $26^{\circ}12.0'\text{N}$ , LONG  $126^{\circ}12.0'\text{W}$ . Your vessel is on course  $285^{\circ}\text{T}$  at a speed of 18 knots. What will be the zone time of sunrise at your vessel?
- (A) 0535
  - (B) 0541
  - (C) 0552
  - (D) 0602

*If choice D is selected set score to 1.*

6. You have steamed 607 miles at 17.0 knots, and consumed 121 tons of fuel. If you have 479 tons of usable fuel remaining, how far can you steam at 14.5 knots?
- (A) 2817 miles
  - (B) 1748 miles
  - (C) 3303 miles
  - (D) 1211 miles

*If choice C is selected set score to 1.*

7. Determine the great circle distance and initial course from LAT  $35^{\circ}27.0'\text{N}$ , LONG  $140^{\circ}20.5'\text{E}$  to LAT  $47^{\circ}51.0'\text{N}$ , LONG  $122^{\circ}51.0'\text{W}$ .
- (A) 4122 miles,  $076^{\circ}\text{T}$
  - (B) 4136 miles,  $076^{\circ}\text{T}$
  - (C) 4087 miles,  $036^{\circ}\text{T}$
  - (D) 4115 miles,  $045^{\circ}\text{T}$

*If choice D is selected set score to 1.*

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8. On 13 October your 0515 zone time fix gives you a position of LAT  $26^{\circ}53.0'N$ , LONG  $90^{\circ}05.0'W$ . Your vessel is on course  $068^{\circ}T$ , and your speed is 7.8 knots. Local apparent noon (LAN) occurs at 1145 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  $54^{\circ}51.5'$ . What is the latitude at 1200 ZT?
- (A)  $27^{\circ}13.3'N$
  - (B)  $27^{\circ}14.6'N$
  - (C)  $27^{\circ}15.7'N$
  - (D)  $27^{\circ}16.8'N$

*If choice A is selected set score to 1.*

9. On 20 June your 0800 zone time DR position is LAT  $21^{\circ}02.0'N$ , LONG  $152^{\circ}50.0'E$ . Your vessel is on course  $265^{\circ}T$  at a speed of 15.0 knots. What is the zone time of local apparent noon (LAN)?
- (A) 1149
  - (B) 1154
  - (C) 1159
  - (D) 1203

*If choice B is selected set score to 1.*

10. You receive a distress call from a vessel reporting her position as LAT  $30^{\circ}21'N$ , LONG  $88^{\circ}34'W$ . Your position is LAT  $24^{\circ}30'N$ , LONG  $83^{\circ}00'W$ . Determine the true course and distance to the distress scene by Mercator sailing.
- (A)  $322^{\circ}T$ , 455 miles
  - (B)  $320^{\circ}T$ , 460 miles
  - (C)  $324^{\circ}T$ , 460 miles
  - (D)  $317^{\circ}T$ , 470 miles

*If choice B is selected set score to 1.*