

U.S.C.G. Merchant Marine Exam

Master TV to Master Less than 500 Gross Registered Tons
Oceans or Near Coastal

Q135 Navigation Problems – Oceans
(Sample Examination)

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

1. You observe the lower limb of the Sun at a sextant altitude (hs) of $34^{\circ}51.4'$ on 18 October. The index error is 2.0' off the arc. The height of eye is 54 feet (16.5 meters). What is the observed altitude (H_o)?
- A. $35^{\circ}01.2'$
 - B. $35^{\circ}03.6'$
 - C. $35^{\circ}05.2'$
 - D. $35^{\circ}07.4'$

Correct answer: A

2. 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 $019.0^{\circ}T$ at a sextant altitude (hs) of $53^{\circ}56.2'$. 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. Mimosa
 - B. Phecda
 - C. Mizar
 - D. Gamma Ursae Minoris

Correct answer: C

3. The zenith is the point on the celestial sphere that is _____.
- A. over Greenwich
 - B. 90° away from the poles
 - C. on the eastern horizon
 - D. directly over the observer

Correct answer: D

4. How often are the time signals broadcast by WWV and WWVH transmitted?
- A. They are transmitted every 15 minutes
 - B. They are transmitted continuously throughout day
 - C. They are transmitted every 30 minutes
 - D. They are transmitted every hour

Correct answer: B

5. Your vessel receives a distress call from a vessel reporting her position as LAT $35^{\circ}01.0'S$, LONG $18^{\circ}51.0'W$. Your position is LAT $35^{\circ}01.0'S$, LONG $21^{\circ}42.0'W$. Determine the true course and distance from your vessel to the vessel in distress by parallel sailing.
- A. $090^{\circ}T$, 140.0 miles
 - B. $090^{\circ}T$, 189.2 miles
 - C. $270^{\circ}T$, 140.0 miles
 - D. $270^{\circ}T$, 189.2 miles

Correct answer: A

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Illustrations: 0 (1 table)

6. On 15 November your 0813 zone time (ZT) fix gives you a position of LAT $22^{\circ}30.0'N$, LONG $67^{\circ}28.0'W$. Your vessel is on course $164^{\circ}T$, and your speed is 13.5 knots. Local apparent noon (LAN) occurs at 1215 ZT, at which time a meridian altitude of the Sun's lower limb is observed. The observed altitude (H_o) for this sight is $49^{\circ}46.0'$. What is the latitude at 1200 ZT?
- A. $21^{\circ}42.5'N$
 - B. $21^{\circ}39.3'N$
 - C. $21^{\circ}36.0'N$
 - D. $21^{\circ}32.8'N$

Correct answer: A

7. With respect to the vernal equinox, what is the length of the year?
- A. tropical year
 - B. anomalistic year
 - C. sidereal year
 - D. All of the above

Correct answer: A

8. The initial great circle course angle between LAT $23^{\circ}00'S$, LONG $42^{\circ}00'W$ and LAT $34^{\circ}00'S$, LONG $18^{\circ}00'E$ is 063.8° . What is the true course?
- A. $063.8^{\circ}T$
 - B. $296.2^{\circ}T$
 - C. $116.2^{\circ}T$
 - D. $243.8^{\circ}T$

Correct answer: C

9. On 24 January your 0700 zone time DR position is LAT $22^{\circ}25.0'N$, LONG $46^{\circ}10.0'W$. Your vessel is on course $110^{\circ}T$ at a speed of 12.0 knots. What is the zone time of local apparent noon (LAN)?
- A. 1203
 - B. 1208
 - C. 1212
 - D. 1215

Correct answer: C

10. On 3 February your 0547 zone time DR position is LAT $24^{\circ}18.5'N$, LONG $167^{\circ}25.0'E$. Considering their magnitude, azimuth, and altitude, which group includes the three bodies best suited for a fix at star time?
- A. Altair, Saturn, Regulus
 - B. Jupiter, Denebola, Regulus
 - C. Arcturus, Kochab, Venus
 - D. Regulus, Deneb, Antares

Correct answer: D

11. What is the major problem with taking high altitude sun observations?
- A. Rapidly changing altitudes make it difficult to get an accurate altitude.
 - B. It is difficult to establish the point where the sextant is vertical to the horizon.
 - C. Possible errors due to unusual refraction may exist.
 - D. The tables are not as accurate due to inherent errors in the spherical triangle at high altitudes.

Correct answer: B

12. On 29 July your 1930 zone time DR position is LONG 164°26.0'E. At that time you observe Polaris with a sextant altitude (hs) of 23°46.8'. The chronometer time of the sight is 08h 32m 18s, and the chronometer error is 02m 26s fast. The index error is 2.7' on the arc, and the height of eye is 56.0 feet. What is your latitude by Polaris?
- A. 24°01.9'N
 - B. 24°19.5'N
 - C. 24°31.7'N
 - D. 25°19.6'N

Correct answer: B

13. 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

14. 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°40.5'N
 - B. 46°54.8'N
 - C. 47°24.7'N
 - D. 47°35.2'N

Correct answer: A

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