

U.S.C.G. Merchant Marine Exam
Mate Offshore Supply Vessels
Q212 Navigation General – Oceans
(Sample Examination)

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

1. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships foghorn 3 1/2 seconds after the signal was sounded. What is the distance to the shore?
- A. 640 yards
 - B. 315 yards
 - C. 143 yards
 - D. 480 yards

Correct answer: A

2. You are inbound in a channel marked by a range. The range line is 309°T. You are steering 306°T and have the range in sight as shown in illustration D047NG below. The range continues to open. What action should you take?
- A. Maintain course as it is normal for the range to open as you get close.
 - B. Alter course to the right to 309°T or more to bring the range in line.
 - C. Alter course to the left until the range closes, then steer to the left of 306°T.
 - D. Alter course to the left to close the range, then alter course to 309°T.

Correct answer: C

3. To measure distance on a Mercator chart between the parallels of LAT 34°30'N and LAT 31°30'N, which 30-mile scale should be used?
- A. 32°15'N to 32°45'N
 - B. 33°00'N to 33°30'N
 - C. 32°45'N to 33°15'N
 - D. 32°30'N to 33°00'N

Correct answer: C

4. The most dangerous form of icing encountered at sea is formed by which of the following?
- A. Hail
 - B. Sea spray
 - C. Freezing rain
 - D. Rime

Correct answer: B

5. Your vessel is on course 270°T, speed 10 knots. The apparent wind is from 10° off the port bow, speed 30 knots. From which direction is the true wind?
- A. 075°T
 - B. 345°T
 - C. 255°T
 - D. 165°T

Correct answer: C

6. The dew point is reached when which condition occurs?
- A. The air becomes saturated with water vapor
 - B. The relative humidity reaches 50%
 - C. The atmospheric pressure is 14.7 lbs. per square inch
 - D. The temperature of the air equals the temperature of the seawater

Correct answer: A

7. What is a characteristic of cardinal marks?
- A. Number-letter combinations for identification
 - B. Vertical stripes
 - C. Square or triangular topmarks
 - D. Light rhythms indicating directional orientation

Correct answer: D

8. Your vessel is participating in the Voluntary Observing Ship Program, you are preparing WS Form B-80 as seen in illustration D041NG below. The dry bulb thermometer reads 78°F and the wet bulb thermometer reads 75°F. How would you encode the air temperature groups in the report?
- A. 10780, 2074/
 - B. 10256, 2074/
 - C. 00256, 0023/
 - D. 10256, 2023/

Correct answer: D

9. The magnitude of three stars is indicated. Which star is the brightest?
- A. Cannot be determined; magnitude indicates size not brightness
 - B. Altair +0.9
 - C. Antares +1.2
 - D. Vega +0.1

Correct answer: D

10. When is an air mass termed "warm"?
- A. If it originated in a high-pressure area
 - B. If the ground over which it moves is cooler than the air
 - C. If it originated in a low-pressure area
 - D. If the mass is above 70°F

Correct answer: B

11. Two well-developed high-pressure areas may be separated by which item?
- A. A hill of low pressure
 - B. A ridge of low pressure
 - C. A trough of low pressure
 - D. A valley of low pressure

Correct answer: C

- 12.** You are sailing south on the Intracoastal Waterway (ICW) when you sight a red nun buoy with a yellow square painted on it. Which statement is TRUE?
- A. The waterway in that area has shoaled and the available depth of water is less than the project depth.
 - B. You should leave the buoy to port.
 - C. ICW traffic should not proceed beyond the buoy unless the crossing waterway is clear of all traffic.
 - D. The buoy is off station and should be ignored as a navigational mark.

Correct answer: B

- 13.** If your weather bulletin shows the center of a low-pressure area to be 100 miles due east of your position, what winds can you expect in the Northern Hemisphere?
- A. East to northeast
 - B. North to northwest
 - C. South to southeast
 - D. East to southeast

Correct answer: B

- 14.** In the IALA Maritime Buoyage System, what is a red and white vertically-striped buoy used to indicate?
- A. Isolated danger
 - B. Safe water
 - C. Preferred channel
 - D. A special mark not primarily used for navigation

Correct answer: B

- 15.** When cold air displaces warm air, you have which type of front?
- A. A cold front
 - B. An occluded front
 - C. A stationary front
 - D. A warm front

Correct answer: A

- 16.** Quadrantal error in a gyrocompass has its GREATEST effect on which of the following?
- A. When the vessel is in high latitudes
 - B. When the vessel is on intercardinal headings
 - C. When the vessel is near the equator
 - D. When the vessel is on north or south headings

Correct answer: B

- 17.** Which is TRUE of mean high water?
- A. It is used as the reference for soundings on the Gulf coast of the U.S.
 - B. It is used to indicate the shoreline where there is a large tidal fluctuation
 - C. It is used as the sounding datum for rivers, lakes, etc. regulated by locks
 - D. It is used as the reference plane for bottom contour lines

Correct answer: B

- 18.** You are in a buoyed channel at night and pass a lighted buoy with an irregular characteristic. Who should you report this to?
- A. The Coast Guard
 - B. The National Ocean Service
 - C. The harbor master
 - D. The Corps of Engineers

Correct answer: A

- 19.** Your vessel is proceeding up a channel, and you see a pair of range lights that are in line ahead. The chart indicates that the direction of this pair of lights is $196^{\circ}T$, and the variation is $7^{\circ}E$. If the heading of your vessel at the time of the sighting is 192° per standard magnetic compass, what is the deviation?
- A. $3^{\circ}E$
 - B. $3^{\circ}W$
 - C. $4^{\circ}E$
 - D. $4^{\circ}W$

Correct answer: B

- 20.** What does a barometer showing falling pressure indicate?
- A. A low dew point
 - B. The approach of a low-pressure system
 - C. The approach of a high-pressure system
 - D. A high dew point

Correct answer: B

- 21.** You take a bearing of 176° of a lighthouse. What bearing of another object would give the best fix?
- A. 000°
 - B. 021°
 - C. 189°
 - D. 272°

Correct answer: D

- 22.** Which is TRUE of a preferred-channel buoy?
- A. They show a white light
 - B. They may be lettered
 - C. They are spherical
 - D. All of the above

Correct answer: B

23. Your vessel is steering 283°T at 10 knots. At 0538 a light bears 350°T , and at 0552 the same light bears 002°T . What will be your distance off abeam?

- A. 11.3 miles
- B. 10.7 miles
- C. 10.3 miles
- D. 9.6 miles

Correct answer: C

24. Which may cause above-normal tides near the center of a hurricane?

- A. Torrential rains
- B. The jet stream
- C. High barometric pressure
- D. Storm surge

Correct answer: D

25. What happens to the intensity of a hurricane as it reaches higher latitudes and cooler waters?

- A. Remains the same
- B. Decreases
- C. Increases
- D. None of the above

Correct answer: B

26. Yesterday your chronometer read 11h 59m 59s at the 1200 GMT time tick. Today the chronometer reads 11h 59m 57s at the 1200 time tick. What is the chronometer rate?

- A. -3s
- B. -2s
- C. +2s
- D. +3s

Correct answer: B

27. You are underway in the North Sea on course 216°T when you sight a buoy bearing 021° relative. Under the IALA Buoyage System, you are in the best navigable water if the buoy has which of the following characteristics?

- A. Has a continuous very quick light
- B. Has a double cone topmark with both points up
- C. Is horizontally banded yellow, black, yellow
- D. Has a light characteristic of Q(6) + L Fl 15s

Correct answer: D

28. What does a single line of position combined with a dead-reckoning position result in?

- A. A running fix
- B. A fix
- C. An assumed position
- D. An estimated position

Correct answer: D

29. To find the specific phase characteristic of a lighthouse on a sound of the United States you would use which reference?

- A. Light List
- B. Nautical Chart Catalog
- C. American Practical Navigator
- D. U.S. Coast Pilot

Correct answer: A

30. Which condition would most likely result in fog?

- A. Dew point falling below the air temperature
- B. Warm moist air blowing over warm water
- C. Airborne dust particles
- D. Warm moist air blowing over cold water

Correct answer: D

31. The spin axis of a gyroscope tends to remain fixed in space in the direction in which it is started. How does this gyroscope become north seeking so that it can be used as a compass?

- A. By starting the compass with the spin axis in a north/south position
- B. By taking advantage of the property of gyroscopic inertia
- C. By mechanically or electrically applying forces to precess the gyroscope
- D. The rotation of the Earth (Earth rate) automatically aligns the gyroscope with north, except for speed errors

Correct answer: C

32. For navigational purposes, each great circle on the Earth has a length of _____.

- A. 21,600 miles
- B. 12,500 miles
- C. 3,600 miles
- D. 5,400 miles

Correct answer: A

33. Which is TRUE of a sea breeze?

- A. A wind caused by the distant approach of a hurricane
- B. A wind that blows towards an island during the day
- C. A wind caused by cold air descending a coastal incline
- D. A wind that blows towards the sea at night

Correct answer: B

34. At which interval should a traditional spring driven marine chronometer be rewound?

- A. Every 12 hours
- B. Once a day
- C. Once every 3 days
- D. Once a week

Correct answer: B

35. Where can information about the direction and velocity of rotary tidal currents be found?

- A. Mariner's Guide
- B. Nautical Almanac
- C. Tidal Current Tables
- D. Tide Tables

Correct answer: C

36. What is the distance from the bottom of a wave trough to the top of a wave crest?

- A. Wave depth
- B. Wave length
- C. Wave breadth
- D. Wave height

Correct answer: D

37. An orange and white buoy indicating a vessel-exclusion area will be marked with what symbol?

- A. Circle
- B. Square
- C. Open-faced diamond
- D. Diamond with a cross

Correct answer: D

38. Which is a characteristic of a port side daymark?

- A. Black and white
- B. Of any shape
- C. Octagonal
- D. Numbered

Correct answer: D

39. You have been observing your radar screen and notice that a contact on the screen has remained in the same position, relative to you, for several minutes. Your vessel is making 10 knots through the water. Which statement is TRUE?

- A. The contact is dead in the water.
- B. The radar is showing false echoes and is probably defective.
- C. The contact is on a reciprocal course at the same speed as your vessel.
- D. The contact is on the same course and speed as your vessel.

Correct answer: D

40. What describes a flood current?

- A. Horizontal movement of the water away from the land following low tide
- B. Horizontal movement of the water toward the land after high tide
- C. Horizontal movement of the water away from the land following high tide
- D. Horizontal movement of the water toward the land after low tide

Correct answer: D

41. You have replaced the chart paper in the course recorder. Which statement is TRUE?

- A. Adjust the chart paper to indicate GMT
- B. Set the zone pen to the far right of the paper
- C. Test the electrical gain to the thermograph pens
- D. Line the course pen up on 0-degree mark

Correct answer: A

42. Which term defines the distance in miles between the circle of equal altitude for the observed altitude (H_o) and the circle of equal altitude for the computed altitude (H_c)?

- A. Zenith angle
- B. Zenith distance
- C. Equation of time
- D. Intercept

Correct answer: D

43. ECDIS units incorporate Digital Chart Data that utilizes which formats?

- A. Imposed viewing formats
- B. Both vector and raster formats
- C. Vector formats only
- D. Raster formats only

Correct answer: B

44. Under the IALA-A Buoyage system, a buoy marking the starboard side of the channel when approaching from seaward may have which feature?

- A. A can shape
- B. A red light
- C. A triangular topmark
- D. An isophase light

Correct answer: C

45. In the celestial equator system of coordinates, what is comparable to latitude on the terrestrial sphere?

- A. Altitude
- B. Celestial meridians
- C. Right ascension
- D. Declination

Correct answer: D

46. What must change for the compass deviation to change?

- A. The longitude of the vessel
- B. The geographical position of the vessel
- C. The heading of the vessel
- D. The speed of the vessel

Correct answer: C

47. In a tropical cyclone, in the Northern Hemisphere, a vessel hove to with the wind shifting counterclockwise is located in which position?

- A. Ahead of the storm center
- B. Directly in the approach path of the storm
- C. In the navigable semicircle
- D. In the dangerous semicircle

Correct answer: C

48. The velocity of the apparent wind can be more than the true wind, and come from the same direction, if certain conditions are present. One condition is that the _____.

- A. true wind velocity must be faster than the ship's speed
- B. true wind must be from dead ahead
- C. ship's speed must be less than the true wind velocity
- D. true wind must be from dead astern

Correct answer: B

49. What should you apply to a fathometer reading to determine the depth of water?

- A. Subtract the sea water correction.
- B. Subtract the draft of the vessel.
- C. Add the draft of the vessel.
- D. Add the sea water correction.

Correct answer: C

50. What do the numbers on isobars indicate?

- A. Temperature
- B. Barometric pressure
- C. Rain in inches
- D. Wind speed

Correct answer: B

51. Which correction(s) must be applied to an aneroid barometer?

- A. Instrument error and height error
- B. Instrument error and latitude correction
- C. Height error only
- D. Instrument error only

Correct answer: A

- 52.** When trying to sight a lighthouse you notice a glare from a town in the background. How does this affect the range at which the light may be sighted?
- A. Increased slightly due to extra lighting
 - B. Considerably reduced and difficult to distinguish
 - C. Unchanged
 - D. Increased if the light is red or green due to contrast with the glare

Correct answer: B

- 53.** The equation of time is 12m 00s and the mean Sun is ahead of the apparent Sun. If you are on the central meridian of your time zone, at what zone time will the apparent Sun cross the meridian?
- A. 1200
 - B. 1212
 - C. 1148
 - D. It cannot be determined from the information given.

Correct answer: B

- 54.** Which of the following is a standard correction applied to the reading of an aneroid barometer?
- A. Latitude
 - B. Wind speed
 - C. Temperature
 - D. Height

Correct answer: D

- 55.** Which term is given to a light that has a light period shorter than its dark period?
- A. Occulting
 - B. Alternating
 - C. Flashing
 - D. Pulsating

Correct answer: C

- 56.** Which publication requires infrequent corrections?
- A. List of Lights
 - B. Radio Navigational Aids
 - C. Coast Pilot
 - D. Sailing Directions (Planning Guide)

Correct answer: D

- 57.** The greater the pressure difference between a high and a low-pressure center, the _____.
- A. warmer the temperature will be
 - B. cooler the temperature will be
 - C. dryer the air mass will be
 - D. greater the force of the wind will be

Correct answer: D

58. What does the description "Racon" beside an illustration on a chart mean?

- A. A radar transponder beacon
- B. A radar calibration beacon
- C. A circular radio beacon
- D. A radar conspicuous beacon

Correct answer: A

59. By convention, what color is the south pole of a magnet painted?

- A. Blue
- B. White
- C. Black
- D. Red

Correct answer: A

60. On a transpacific voyage, you receive a message from your vessel's operators saying that your vessel has been consigned to voluntary Naval Cooperation and Guidance for Shipping (NCAGS). Where can further information be located?

- A. The Light List
- B. the Coast Pilot
- C. Radio Aids to Navigation (PUB 117)
- D. the International Code of Signals (PUB 102)

Correct answer: C

61. Revolution is the _____.

- A. Spinning of a celestial body about its axis
- B. Wobbling of the Earth about its axis
- C. Motion of a celestial body in an orbit
- D. Motion of bodies in the solar system relative to the stars

Correct answer: C

62. You are underway on course 050°T and your maximum speed is 12 knots. The eye of a hurricane bears 080°T, 100 miles from your position. The hurricane is moving towards 265°T at 22 knots. If you maneuver at 12 knots to avoid the hurricane, what could be the maximum CPA?

- A. 56 miles
- B. 63 miles
- C. 76 miles
- D. 69 miles

Correct answer: B

63. Which type of cloud is composed entirely of ice crystals and is found at very high altitudes?

- A. Nimbostratus
- B. Cirrus
- C. Stratus
- D. Cumulus

Correct answer: B

64. A ship is on course 195° at a speed of 15 knots. The apparent wind is from 40° on the port bow, speed 30 knots. What are the direction and speed of the true wind?

- A. 068°T , 30 knots
- B. 127°T , 21 knots
- C. 263°T , 42 knots
- D. 292°T , 42 knots

Correct answer: B

65. Which causes the Earth's irregular heating?

- A. The time of day
- B. The geography
- C. The seasons
- D. All of the above

Correct answer: D

66. A List of Lights entry (L Fl) is a single flashing light which shows a long flash of not less than which duration?

- A. 1.0 second duration
- B. 1.5 seconds duration
- C. 2.0 seconds duration
- D. 3.0 seconds duration

Correct answer: C

67. Which clouds is a thin, whitish, high cloud popularly known as "mares' tails"?

- A. Cirrostratus
- B. Cumulus
- C. Altostratus
- D. Stratus

Correct answer: A

68. A sailing chart could have which scale?

- A. Less than 1:25,000
- B. 1:35,000
- C. 1:100,000
- D. 1:700,000

Correct answer: D

69. Your longitude is $179^{\circ}59'W$. The LMT at this longitude is 23h 56m on the 4th day of the month. Six minutes later, your position is $179^{\circ}59'E$ longitude. What is your LMT and date?

- A. 23h 50m on the 5th
- B. 00h 02m on the 4th
- C. 00h 02m on the 5th
- D. 00h 02m on the 6th

Correct answer: D

70. You are in LONG $165^{\circ}E$, zone time at 0400, 1 November. What is the zone time and date in LONG $165^{\circ}W$?

- A. 1800, 31 October
- B. 0600, 1 November
- C. 1800, 1 November
- D. 0600, 31 October

Correct answer: D

United States Coast Guard National Maritime Center



D041NG

NO.		SHIP NAME	DATE SENT (UTC)	TIME SENT (UTC)	STA. CALLED	FREQUENCY
ADDRESSES						
U.S. Coast Guard: No address needed, start with BBXX indicator and ship's call sign.						
INMARSAT Standard A: Select—Coast Earth Station (CES), routine priority, duplex telex channel, and initiate call. When GA + is received, select 41 +. Upon receipt of answerback, NWS OBS MHTS, send the weather report starting with the BBXX indicator and ship's call sign. End the report with 5 periods. Try to limit INMARSAT call time to 30 seconds. Standard C: To establish special access code 41, see manufacturers recommended instructions for set-up, or the Mariners Weather Log Summer, 1994, or later editions.						
U.S. commercial and foreign radio stations: To: OBS METEO _____ (get address from "Radio Stations Accepting. . . ."). Start with BBXX indicator and ship's call sign and combine the remaining numbers into 10-character groups.						
INDICATOR	CALL SIGN	YYGGi _w	99L _a L _a L _a	Q _c L _o L _o L _o L _o	i _R i _x hVV	Nddff
BBXX			99		4	
00fff	1s _n TTT	2s _n T _d T _d T _d	4PPPP	5appp	7wwW ₁ W ₂	8N _h C _L C _M C _H
222D _s v _s	0s _t T _w T _w T _w	2P _w P _w H _w H _w	3d _{w1} d _{w1} d _{w2} d _{w2}	4P _{w1} P _{w1} H _{w1} H _{w1}	5P _{w2} P _{w2} H _{w2} H _{w2}	6I _s E _s E _s R _s
8S _w T _b T _b T _b	ICE	c _i S _i b _i D _i z _i	PLAIN LANGUAGE			TRANSMITTED BY
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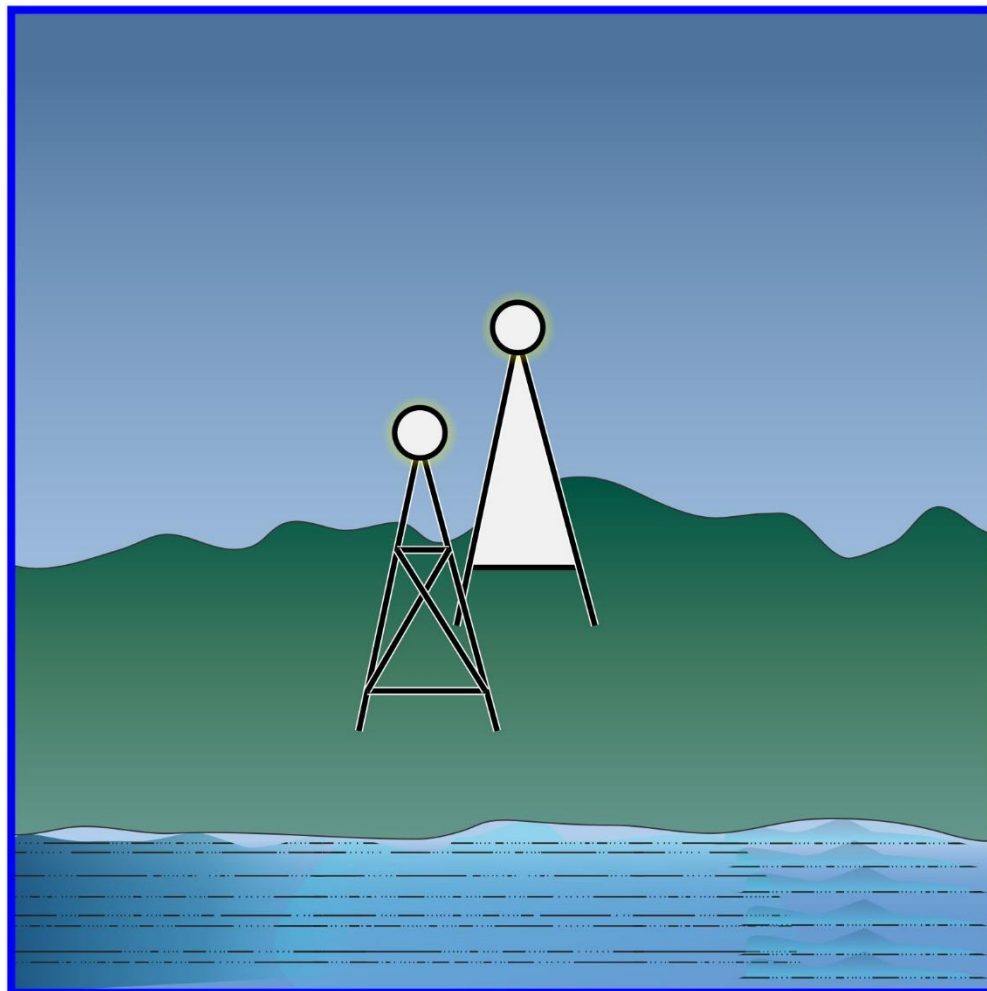
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