

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. Prior to reading an aneroid barometer, why should you tap the face lightly with your finger?
- A. To expose any loose connections
 - B. To bring the pointer to its true position
 - C. To contract and expand the glass face
 - D. To demagnetize the metal elements

Correct answer: B

2. Which type of weather could you expect soon after seeing "hook" or "comma" shaped cirrus clouds?
- A. Continuing fog and rain
 - B. Rain with the approach of a warm front
 - C. The formation of a tropical depression
 - D. Clearing with the approach of a cold front

Correct answer: B

3. Deviation is the angle between the _____.
- A. magnetic meridian and the axis of the compass card
 - B. axis of the compass card and the degaussing meridian
 - C. true meridian and the magnetic meridian
 - D. true meridian and the axis of the compass card

Correct answer: A

4. For navigational purposes, each great circle on the Earth has a length of _____.
- A. 12,500 miles
 - B. 5,400 miles
 - C. 3,600 miles
 - D. 21,600 miles

Correct answer: D

5. Which condition would most likely result in fog?
- A. Airborne dust particles
 - B. Warm moist air blowing over cold water
 - C. Dew point falling below the air temperature
 - D. Warm moist air blowing over warm water

Correct answer: B

6. How can the value of a minor index error of a sextant be determined?
- A. By the index mirror
 - B. By the horizon glass
 - C. By the sextant frame
 - D. By the micrometer drum

Correct answer: D

7. Under the IALA-A Buoyage System, when entering from seaward, a buoy indicating the preferred channel is to starboard may have which of the following?
- A. A green light
 - B. A long-flashing light characteristic
 - C. A square topmark
 - D. A conical shape

Correct answer: C

8. At about GMT 1436, on 3 December, the lower limb of the Moon is observed with a sextant having an index error of 2.5' on the arc. The height of eye is 32 feet. The sextant altitude (hs) is 3°38.8'. What is the observed altitude?
- A. Ho 4°18.6'
 - B. Ho 4°29.1'
 - C. Ho 4°36.3'
 - D. Ho 4°42.2'

Correct answer: B

9. Which type of daymark is used to mark the starboard side of the channel when entering from sea?
- A. Green square
 - B. Black and white diamond
 - C. Red triangle
 - D. Red and white octagon

Correct answer: C

10. 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 if the light is red or green due to contrast with the glare
 - B. Unchanged
 - C. Considerably reduced and difficult to distinguish
 - D. Increased slightly due to extra lighting

Correct answer: C

11. You are in LONG 165°E, zone time at 0400, 1 November. What is the zone time and date in LONG 165°W?
- A. 1800, 31 October
 - B. 0600, 31 October
 - C. 1800, 1 November
 - D. 0600, 1 November

Correct answer: B

12. Which Beaufort force indicates a wind speed of 65 knots?
- A. Beaufort force 0
 - B. Beaufort force 6.5
 - C. Beaufort force 12
 - D. Beaufort force 15

Correct answer: C

13. In the Northern Hemisphere, your vessel is believed to be in the direct path of a hurricane, and plenty of sea room is available. Which is the best course of action?
- A. Place the wind on the starboard quarter, note the course, and head in that direction making as much way as possible
 - B. Place the wind on the port bow, note the course, and head in that direction making as much way as possible
 - C. Place the wind on the starboard bow, note the course, and head in that direction making as much way as possible
 - D. Place the wind on the port quarter, note the course, and head in that direction making as much way as possible

Correct answer: A

14. While entering a harbor on a course of 225° per gyrocompass, you take a bearing on a pair of range lights and get 220° per gyrocompass. The bearing on the chart is 217°T . The variation for the area is 6°W , and deviation is 2°W . What course would you steer per gyrocompass to make good a true course of 232° ?
- A. 229°pgc
 - B. 231°pgc
 - C. 233°pgc
 - D. 235°pgc

Correct answer: D

15. Which is an area of strong westerly winds occurring between 40°S and 60°S latitude?
- A. Polar easterlies
 - B. Jet streams
 - C. Prevailing westerlies
 - D. Roaring forties

Correct answer: D

16. Which information does the outer ring of a compass rose on a nautical chart provide?
- A. Magnetic directions
 - B. Annual rate of variation change
 - C. Variation
 - D. True directions

Correct answer: D

17. 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. 345°T
 - B. 165°T
 - C. 255°T
 - D. 075°T

Correct answer: C

18. An orange and white buoy with a rectangle on it displays what information?

- A. directions
- B. locations
- C. distances
- D. All of the above

Correct answer: D

19. The survey information upon which a chart is based is found at which location?

- A. Near the chart title
- B. At the top center of the next line
- C. At the lower left corner
- D. At any convenient location

Correct answer: A

20. Which name is given to the pressure-sensitive element of an aneroid barometer?

- A. Syphon cell
- B. Column of mercury
- C. Pressure bellows
- D. Constant pressure capsule

Correct answer: A

21. What natural feature is responsible for the rather even climate found on the Florida peninsula throughout the year?

- A. Strong masses of continental air
- B. The Bermuda high
- C. The cool waters of the Sargasso Sea
- D. The Gulf Stream

Correct answer: D

22. The apparent wind's speed can be zero, but only when two conditions are present. One condition is that the true _____.

- A. wind's speed equals the ship's speed
- B. wind must be from dead ahead
- C. wind must be on the beam
- D. wind's speed must be zero

Correct answer: A

23. Your ship is proceeding on course 320°T at a speed of 25 knots. The apparent wind is from 30° off the starboard bow, speed 32 knots. What is the relative direction, true direction and speed of the true wind?

- A. Relative 60°, true 040°T, 18.6 knots
- B. Relative 40°, true 080°T, 16.4 knots
- C. Relative 80°, true 060°T, 15.2 knots
- D. Relative 80°, true 040°T, 16.2 knots

Correct answer: D

24. You take a bearing of 313° and 076° of two objects. Which bearing of a third object will give the best fix?

- A. 339°
- B. 014°
- C. 255°
- D. 133°

Correct answer: B

25. Which defines a wave's fetch?

- A. The measurement of a wave's steepness
- B. The time in seconds required for two crests to pass a given point
- C. The distance a wave travels between formation and decay
- D. The stretch of water over which a wave-forming wind blows

Correct answer: D

26. On a chart, the characteristic of the light on a lighthouse is shown as flashing white with a red sector. Which is TRUE of the red sector?

- A. It indicates a danger area
- B. It indicates the limits of the navigable channel
- C. It serves no significant purpose
- D. It is used to identify the characteristics of the light

Correct answer: A

27. Which term is given to the points where the Sun is at 0o declination?

- A. Perigee
- B. Apogee
- C. Solstices
- D. Equinoxes

Correct answer: D

28. What is a system of reservoirs and connecting tubes in a gyro compass called?

- A. The spider element
- B. The rotor
- C. The gyrotron
- D. The mercury ballistics

Correct answer: D

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

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

Correct answer: B

30. You are entering an east coast port and see a buoy with a yellow triangle painted on it. What does the symbol indicate?
- A. The buoy is off station
 - B. The buoy is a special mark
 - C. The buoy designates a sharp turn in the channel
 - D. You are in the vicinity of the ICW

Correct answer: D

31. Your vessel is participating in the Voluntary Observing Ship Program, you are preparing WS Form B-80 as seen in illustration D041NG below. Your position is LAT 64°42'N, LONG 02°28'W. How would this be encoded?
- A. 9064N, 9025W
 - B. 0647N, 00025
 - C. 99647, 70025
 - D. 90647, 90024

Correct answer: C

32. What is the gyrocompass error resulting from your vessel's movement in OTHER than an east-west direction?
- A. Ballistic deflection
 - B. Quadrantal error
 - C. Damping error
 - D. Speed error

Correct answer: D

33. General information about the location, characteristics, facilities, and services for U.S. and foreign ports may be obtained from which publication?
- A. World Port Index
 - B. Sailing Directions
 - C. Distances Between Ports
 - D. Coast Pilot

Correct answer: A

34. When within 300 miles of a named tropical storm or hurricane, it is standard practice to send weather reports at which time interval?
- A. Every hour
 - B. Every 6 hours
 - C. Every 8 hours
 - D. Every 3 hours

Correct answer: D

35. You sight an isolated danger buoy with a white flashing light showing a group of two flashes. The buoy indicates you should take which action?
- A. You should pass well clear on either side of the buoy
 - B. You must pass north of the buoy
 - C. You must pass the buoy close to starboard
 - D. You must pass south of the buoy

Correct answer: A

36. What does the expression "the air is saturated" mean?
- A. The vapor pressure is at its maximum for the prevailing temperature
 - B. The precipitation has commenced
 - C. The relative humidity is 100%
 - D. The cloud cover is 100%

Correct answer: C

37. How are clouds formed?
- A. As winds blow across bodies of water, the sun causes the moisture to be absorbed and move upward forming clouds
 - B. As a mass of warm, humid air rises into the atmosphere and cools, condensing moisture into small droplets
 - C. Only when the relative humidity of the atmosphere is low
 - D. Dry air compresses moisture from the atmosphere into clouds

Correct answer: B

38. A marine sextant has the index arm set at zero and the reflected image of the horizon forms a continuous line with the actual image. When the sextant is rotated about the line of sight the images separate. The sextant has which error?
- A. Centering error
 - B. Error of perpendicularity
 - C. Side error
 - D. Prismatic error

Correct answer: C

39. You are on course $357^{\circ}T$ and take a relative bearing of a lighthouse of 180° . What is the true bearing to the lighthouse?
- A. 003°
 - B. 363°
 - C. 227°
 - D. 177°

Correct answer: D

40. Which is a characteristic of warm air masses?

- A. Turbulence within the mass
- B. Heavy precipitation
- C. Good visibility
- D. Stratiform clouds

Correct answer: D

41. You are underway on course 050°T and your maximum speed is 11 knots. The eye of a hurricane bears 070°T, 80 miles from your position. The hurricane is moving towards 270°T at 19 knots. What course should you steer at 11 knots to have the maximum CPA?

- A. 250°
- B. 234°
- C. 215°
- D. 227°

Correct answer: C

42. The measurement of local time is based on the passage of the Sun over the _____.

- A. lower branch of the observer's meridian
- B. upper branch of the Greenwich meridian
- C. lower branch of the Greenwich meridian
- D. upper branch of the observer's meridian

Correct answer: A

43. Which term is used to define the point where the vertical rise or fall of tide has stopped?

- A. Slack water
- B. The rip tide
- C. The stand of the tide
- D. The reverse of the tide

Correct answer: C

44. Which of the sources contains information on Northern Right Whales?

- A. The Nautical Almanac
- B. Ship's Medicine Chest and Medical Aid at Sea
- C. HO 229
- D. The Coast Pilot

Correct answer: D

45. The largest waves (heaviest chop) will usually develop where the wind blows _____.

- A. against the flow of the current
- B. over slack water
- C. at right angles to the flow of the current
- D. in the same direction as the flow of the current

Correct answer: A

46. On an isomagnetic chart, which term is used for the line of zero variation?

- A. The zero-variation line
- B. An isogonic line
- C. An agonic line
- D. A variation line

Correct answer: C

47. What is the standard time meridian for description +12?

- A. 165.0°W
- B. 172.5°W
- C. 172.5°E
- D. 180.0°

Correct answer: D

48. An electronic depth finder operates on which principle?

- A. Radar signals travel at a constant speed through water
- B. Sound waves travel at a constant speed through water
- C. Pressure increases with depth
- D. Radio signals reflect from a solid surface

Correct answer: B

49. You are approaching Chatham Strait from the south in foggy weather. You have Coronation Island and Hazy Islands on the radar. Suddenly the radar malfunctions. You then resort to using whistle echoes to determine your distance off Coronation Island. Your stopwatch reads 16.3 seconds for the echo to be heard. How far are you off Coronation Island?

- A. 1.0 mile
- B. 1.5 miles
- C. 2.0 miles
- D. 2.5 miles

Correct answer: B

50. Which term is given to the vertical angle between the horizontal and the magnetic line of force?

- A. Elevation
- B. Magnetic angle
- C. Vertical angle
- D. Magnetic dip

Correct answer: D

51. What is the color scheme of navigational marks used for informational or regulatory purposes?

- A. Red and white vertically-striped
- B. White with orange geometric shapes
- C. Solid yellow
- D. Green and red horizontally-banded

Correct answer: B

52. The speed of sound through ocean water is nearly always _____.
- A. faster than the speed of calibration for the fathometer
 - B. slower than the speed of calibration for the fathometer
 - C. the same speed as the speed of calibration for the fathometer
 - D. faster than the speed of calibration for the fathometer, unless the water is very warm

Correct answer: A

53. Where can complete information on weather broadcasts throughout the world be found?
- A. The Coast Pilot Volume 2
 - B. The Amver worldwide voluntary reporting system
 - C. The Selected Worldwide Marine Weather Broadcasts
 - D. The Notice to Mariners

Correct answer: C

54. What do red sectors of navigation lights warn mariners of?
- A. Shoals or nearby land
 - B. Recently sunken vessels
 - C. Floating debris
 - D. Heavily trafficked areas

Correct answer: A

55. What is the standard atmospheric pressure as measured in inches of mercury?
- A. 29.92
 - B. 500.0
 - C. 760.0
 - D. 1013.2

Correct answer: A

56. You are steering $257^{\circ}T$, and a light is picked up dead ahead at a distance of 13.3 miles at 2016. You change course to pass the light 4 miles off abeam to starboard. If you are making 18.5 knots, what is your ETA at the position 4 miles off the light?
- A. 2100
 - B. 2113
 - C. 2057
 - D. 2103

Correct answer: C

57. When using a buoy as an aid to navigation which of the following should be considered?
- A. If the light is flashing the buoy should be considered to be in the charted location.
 - B. The buoy may not be in the charted position.
 - C. The buoy should be considered to be in the charted position if it has been freshly painted.
 - D. The buoy should be considered to always be in the charted position.

Correct answer: B

58. Which term is given to a radar display which is oriented, so that north is always at the top of the screen?

- A. Unstabilized display
- B. Stabilized display
- C. Composite display
- D. Relative display

Correct answer: B

59. The distance between any two meridians measured along a parallel of latitude and expressed in miles is the _____.

- A. departure
- B. meridian angle
- C. difference in longitude
- D. mid-longitude

Correct answer: A

60. Which of the symbols shown in illustration D018NG below represents an occluded front?

- A. A
- B. B
- C. C
- D. D

Correct answer: D

61. In the Northern Hemisphere, when the center of a high-pressure system is due east of your position, you can expect winds from which direction?

- A. North to west
- B. South to east
- C. South to west
- D. North to east

Correct answer: B

62. On charts of U.S. waters, a magenta marking is NOT used for marking a _____.

- A. prohibited area
- B. radio beacon
- C. 5-fathom curve
- D. lighted buoy

Correct answer: C

63. How can you estimate the position of a tropical storm's center?

- A. Using shipboard radar
- B. With a radio weather bulletin or weather fax
- C. Observe the wind direction and apply Buys Ballot's law
- D. All of the above

Correct answer: D

64. Which is TRUE of echo-sounders?

- A. They measure the average depth from waterline to hard bottom
- B. They measure the average depth of water to soft bottom
- C. They measure the actual depth of water below keel
- D. They measure the actual depth of water

Correct answer: C

65. According to Buys Ballot's law, when an observer in the Northern Hemisphere experiences a northwest wind, where is the center of low pressure located?

- A. Northwest of the observer
- B. South-southeast of the observer
- C. West-southwest of the observer
- D. Northeast of the observer

Correct answer: D

66. Which type of precipitation occurs only in thunderstorms with strong convection currents that convey raindrops above and below the freezing level?

- A. Rime
- B. Hail
- C. Freezing rain
- D. Sleet

Correct answer: B

67. You are underway on course 142°T when you sight a buoy bearing 105°T. The buoy's white light has a characteristic of continuous very-quick flashing. What should you do to ensure that your vessel remains in the best navigable water?

- A. Continue on course and ensure that the bearings change to the left
- B. Alter course to port and pass the buoy close aboard to either side
- C. Pass between the buoy and another buoy showing a fixed white light
- D. Alter course to port and pass north of the buoy

Correct answer: D

68. In which country would you expect the channels to be marked with the IALA-B Buoyage System?

- A. Peru
- B. Morocco
- C. Poland
- D. Saudi Arabia

Correct answer: A

69. The Star Lists in the Nautical Almanac are based on which of the following magnitudes?

- A. First
- B. Third
- C. Sixth
- D. Tenth

Correct answer: B

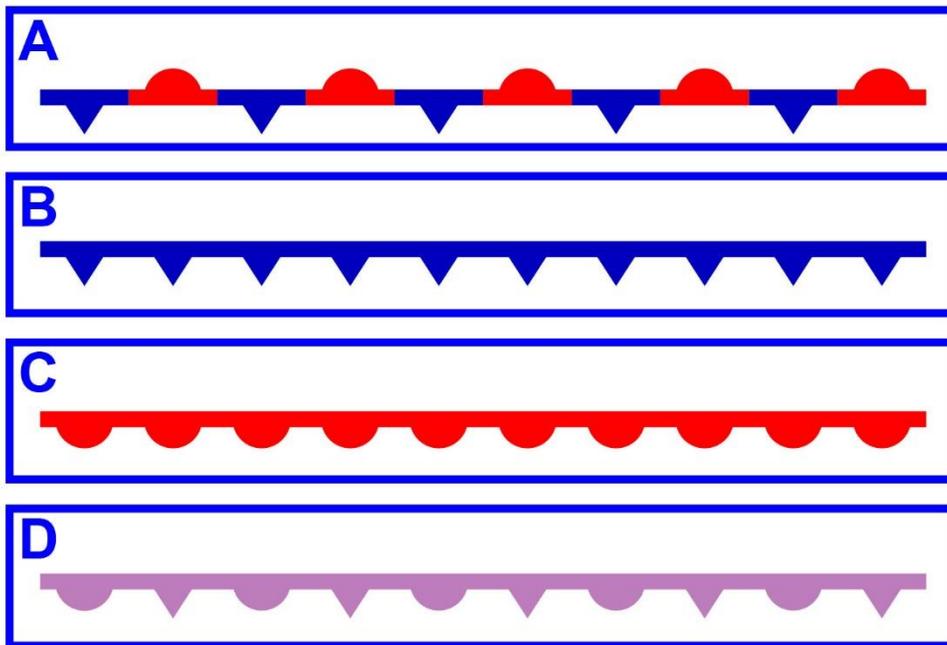
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Illustrations: 2

70. Which light characteristic may be used on a special purpose mark?

- A. Fixed
- B. Equal interval
- C. Occulting
- D. Quick flashing

Correct answer: A

D018NG



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D041NG

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| WEATHER REPORT FOR IMMEDIATE TRANSMISSION | | | | | | |
| 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. | | | | | | |
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| BBXX | | | 99 | | 4 | |
| ØØfff | 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 |
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| 222D _s v _s | Øs _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 |
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| 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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