

U.S.C.G. Merchant Marine Exam
Second/Third Mate of Unlimited Tonnage
Q114 Navigation General – Oceans
(Sample Examination)

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

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

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

Correct answer: D

2. How is an occluded front represented on a weather map?

- A. A dashed blue line
- B. A purple line
- C. A blue line
- D. An alternate red and blue line

Correct answer: B

3. What is published by the U.S. Coast Guard?

- A. U.S. Coast Pilot
- B. Nautical Charts
- C. Tide Tables
- D. Light List

Correct answer: D

4. The apparent wind is zero when which situation exists with the true wind?

- A. The true wind is from ahead and equal to the ship's speed
- B. The true wind is from astern and is twice the ship's speed
- C. The true wind is from astern and equal to the ship's speed
- D. The true wind is zero

Correct answer: C

5. How can you follow the approach of a dangerous cyclonic storm?

- A. Review the Coast Pilot or Sailing Directions
- B. By a newspaper, a weather map, a weather fax, or a weather forecast
- C. By monitoring the change in the sea temperature
- D. Utilizing the National Weather Service Observing Handbook No.1, Marine Surface Observations

Correct answer: B

6. Which is a characteristic of warm air masses?

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

Correct answer: A

7. 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

8. Which condition(s) is(are) necessary for the formation of dew?

- A. A surface warmer than the dew point of the air
- B. Available nuclei in the air
- C. Moderate winds
- D. Clear skies

Correct answer: D

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

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

Correct answer: A

10. Your vessel is on course 150°T, speed 17 knots. The apparent wind is from 40° off the starboard bow, speed 15 knots. What is the speed of the true wind?

- A. 9.0 knots
- B. 10.2 knots
- C. 11.0 knots
- D. 12.0 knots

Correct answer: C

11. Your ship is entering port from sea, and you sight a pair of range lights. When in line, they bear 315° per standard magnetic compass. The chart shows that the range bearing is 312°T, and that variation is 6°W. What is the deviation of your compass at the time of the sighting?

- A. 3°E
- B. 3°W
- C. 9°E
- D. 9°W

Correct answer: A

12. What must the owner or Master do if any of the towing vessel's required navigational safety equipment fails during a voyage?

- A. Consider the state of the equipment in deciding whether it is safe for the vessel to proceed
- B. Enter its failure in the log or other on-board record
- C. Repair it at the earliest practicable time
- D. All of the above

Correct answer: D

13. While taking weather observations, you determine that the wind is coming from the west. In the weather log, how would you record the wind direction?

- A. 000°
- B. 090°
- C. 180°
- D. 270°

Correct answer: D

14. A daymark used to indicate the starboard side of the channel when approaching from seaward will have the shape indicated by what letter in illustration D045NG below?

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

Correct answer: D

15. The new Moon cannot be seen because the Moon is _____.

- A. Below the horizon
- B. At quadrature
- C. In the opposite direction of the Sun
- D. Between the Earth and the Sun

Correct answer: D

16. In the horizon system of coordinates what is equivalent to the equator on the Earth?

- A. Horizon
- B. Principal vertical circle
- C. Parallels of altitude
- D. Prime vertical circle

Correct answer: A

- 17.** You are sailing south on the Intracoastal Waterway (ICW) when you sight a green can buoy with a yellow square painted on it. Which of the following is TRUE?
- A. You should leave the buoy to port.
 - B. You should pass the buoy close aboard on either side.
 - C. The yellow square is retro-reflective material used to assist in sighting the buoy at night.
 - D. The buoy marks the end of the ICW in that area.

Correct answer: A

- 18.** Your vessel is on course 180°T speed 22 knots. The apparent wind is from 70° off the port bow, speed 20 knots. What are the true direction and speed of the wind?
- A. 45°T, 21.0 knots
 - B. 51°T, 24.0 knots
 - C. 58°T, 21.2 knots
 - D. 64°T, 26.0 knots

Correct answer: B

- 19.** Some lights used as aids to marine navigation have a red sector to indicate a danger area. The limits of a colored sector of a light are listed in the Light List in which of the following manners?
- A. True bearings as observed from the light toward the ship
 - B. An outline of the area of the sector
 - C. True bearings as observed from the ship toward the light
 - D. Geographical positions outlining the area of the sector

Correct answer: C

- 20.** Fog forms when the air temperature is at or below _____.
- A. 32°F
 - B. the wet bulb temperature
 - C. the dry bulb temperature
 - D. the dew point

Correct answer: D

- 21.** Under the IALA-A Buoyage System, a buoy indicating the preferred channel is to port would have _____.
- A. an odd number
 - B. a pillar shape
 - C. an even number
 - D. horizontal bands

Correct answer: D

22. Which cloud commonly produces a halo about the Sun or Moon?

- A. Altostratus
- B. Cirrocumulus
- C. Altocumulus
- D. Cirrostratus

Correct answer: D

23. You have another ship overtaking you close aboard to starboard. You have 3 radar targets bearing 090° relative at ranges of .5-mile, 1 mile, and 1.5 miles. Which term is given to these unwanted echoes?

- A. Spoking
- B. Multiple echoes
- C. Side-lobe echoes
- D. Indirect echoes

Correct answer: B

24. The latitude of the upper vertex of a great circle is 36°N. What is the latitude of the lower vertex?

- A. 36°S
- B. 36°N
- C. 0°
- D. Cannot be determined from the information given

Correct answer: A

25. Which term is given to that half of the hurricane to the right-hand side of its track (as you face the same direction that the storm is moving) in the Northern Hemisphere?

- A. The dangerous semicircle
- B. The windward side
- C. The leeward side
- D. The safe semicircle

Correct answer: A

26. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's foghorn 3 seconds after the signal was sounded. What is the distance to the shore?

- A. 792 yards
- B. 1100 yards
- C. 550 yards
- D. 872 yards

Correct answer: C

27. Where can the annual change in variation for an area be found?

- A. The handbook for Magnetic Compass Adjustment, Pub 226
- B. The center of the compass rose on a chart of the area
- C. The compass deviation table
- D. Variation does not change.

Correct answer: B

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

Correct answer: A

29. You are underway on course 050°T and your maximum speed is 12 knots. The eye of a hurricane bears 120°T, 110 miles from your position. The hurricane is moving towards 285°T at 25 knots. What course should you steer at 12 knots to have the maximum CPA?

- A. 332°
- B. 339°
- C. 346°
- D. 357°

Correct answer: C

30. In the North Sea area, you sight a buoy with a quick light showing 3 flashes every 10 seconds. Which topmark in illustration D030NG below would be fitted to this buoy under the IALA Buoyage Systems?

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

Correct answer: D

31. 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. 0644
- C. 0647
- D. 0653

Correct answer: B

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

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

Correct answer: B

33. Which term is given to a light that has a light period shorter than its dark period?

- A. Flashing
- B. Alternating
- C. Pulsating
- D. Occulting

Correct answer: A

34. What is the definition of height of tide?

- A. The vertical distance from the tidal datum to the level of the water at any time
- B. The vertical difference between the heights of low and high water
- C. The vertical difference between a datum plane and the ocean bottom
- D. The vertical distance from the surface of the water to the ocean floor

Correct answer: A

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

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

Correct answer: D

36. What is the equivalent of 37 min. 32 sec. in arc units?

- A. $6^\circ 38'$
- B. $4^\circ 47'$
- C. $7^\circ 41'$
- D. $9^\circ 23'$

Correct answer: D

37. Which causes the wind flow from the horse latitudes to the doldrums to be deflected?

- A. The Coriolis force
- B. Differing atmospheric pressures
- C. The mid-latitude, semi-permanent high
- D. The prevailing westerlies

Correct answer: A

38. Which defines a wave's fetch?

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

Correct answer: C

39. What will a veering wind do?

- A. Vary in strength constantly and unpredictably
- B. Change direction in a clockwise manner in the Northern Hemisphere
- C. Circulate about a low-pressure center in a counterclockwise manner in the Northern Hemisphere
- D. Circulate about a high-pressure center in a clockwise manner in the Southern Hemisphere

Correct answer: B

40. The dew point is reached when which condition occurs?

- A. The temperature of the air equals the temperature of the seawater
- B. The air becomes saturated with water vapor
- C. The relative humidity reaches 50%
- D. The atmospheric pressure is 14.7 lbs. per square inch

Correct answer: B

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

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

Correct answer: D

42. If a weather bulletin shows the center of a low-pressure system to be 100 miles due east of you, what winds can you expect in the Southern Hemisphere?

- A. North-northeasterly
- B. South-southwesterly
- C. North-northwesterly
- D. South-southeasterly

Correct answer: B

43. A position that is obtained by applying estimated current and wind to your vessel's course and speed is a(n) _____.

- A. dead reckoning position
- B. estimated position
- C. fix
- D. None of the above

Correct answer: B

44. After an item of required safety equipment on a towing vessel fails, the owner or Master must consider all of these factors before continuing the voyage, EXCEPT the _____.

- A. weather conditions, including visibility
- B. dictates of good seamanship
- C. estimated time of arrival promised to the customer
- D. safety of the vessel, considering the other traffic in the area

Correct answer: C

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

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

Correct answer: D

46. In which source could you find the number of a chart for a certain geographic area?

- A. Chart No. 1
- B. Catalog of Charts
- C. Pub.117 Radio Navigational Aids
- D. American Practical Navigator

Correct answer: B

47. Which is TRUE for the directive force acting on a gyrocompass?

- A. The force increases as the latitude decreases, being maximum at the geographic equator
- B. The force increases as the latitude increases, being maximum at the geographic poles
- C. The force remains the same at all latitudes
- D. The force is greatest when a vessel is near the Earth's magnetic equator

Correct answer: A

48. 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

49. Which is TRUE if the compass heading and the magnetic heading are the same?

- A. The deviation has been offset by the variation
- B. There is something wrong with the compass
- C. There is no deviation on that heading
- D. The compass is being influenced by nearby metals

Correct answer: C

50. To find a magnetic compass course from a true course what must you apply?

- A. Deviation and variation
- B. Magnetic anomalies (local disturbances)
- C. Variation
- D. Deviation

Correct answer: A

51. How often are the time signals broadcast by WWV and WWVH transmitted?

- A. They are transmitted continuously throughout day
- B. They are transmitted every 15 minutes
- C. They are transmitted every 30 minutes
- D. They are transmitted every hour

Correct answer: A

52. In the IALA Buoyage System, what do buoys with alternating red and green horizontal bands indicate?

- A. Spoil grounds
- B. Fishing areas
- C. An isolated danger
- D. The preferred channel

Correct answer: D

53. Buoys which mark dredging areas are painted which color?

- A. Black
- B. Green
- C. Red
- D. Yellow

Correct answer: D

54. Which describes the wind circulation around a high-pressure center in the Northern Hemisphere?

- A. Counterclockwise and moving outward from the high
- B. Clockwise and moving outward from the high
- C. Clockwise and moving towards the high
- D. Counterclockwise and moving towards the high

Correct answer: B

55. What is an ebb current?

- A. A current at minimum flow
- B. A current going out or downstream
- C. A current at maximum flow
- D. A current coming in or upstream

Correct answer: B

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

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

Correct answer: B

57. Which of the following is a standard correction applied to the reading of an aneroid barometer?

- A. Height
- B. Temperature
- C. Wind speed
- D. Latitude

Correct answer: A

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

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

Correct answer: D

59. What is the primary source of the earth's weather?

- A. The solar system
- B. The moon
- C. The sun
- D. The oceans

Correct answer: C

60. 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. Increased slightly due to extra lighting
- C. Unchanged
- D. Considerably reduced and difficult to distinguish

Correct answer: D

61. If the electronic chart is part of an ECDIS, it must display the minimum data required by IMO/IHO. Which is NOT required to be displayed?

- A. Aids to navigation
- B. Regulatory boundaries
- C. Hydrography
- D. Tidal currents

Correct answer: D

62. Which is TRUE for a sextant having an index error that is "on the arc"?

- A. It has semidiameter error
- B. It has dip error
- C. It has a negative correction
- D. It has a positive correction

Correct answer: C

63. In shallow water, waves that are too steep to be stable, causing the crests to move forward faster than the rest of the wave. This occurrence describes which term?

- A. Surfers
- B. White caps
- C. Breakers
- D. Rollers

Correct answer: C

64. In which situation does a great circle track provides the maximum saving in distance?

- A. On easterly courses in high latitudes
- B. On southerly courses in high latitudes
- C. On westerly courses in low latitudes
- D. On easterly courses in low latitudes that cross the equator

Correct answer: A

65. The four standard light colors used for lighted aids to navigation are red, green, white, and _____.

- A. blue
- B. purple
- C. yellow
- D. orange

Correct answer: C

66. 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 must pass north of the buoy
- B. You should pass well clear on either side of the buoy
- C. You must pass the buoy close to starboard
- D. You must pass south of the buoy

Correct answer: B

67. During daylight savings time the meridian used for determining the time is located farther _____.

- A. east
- B. west in west longitude and east in east longitude
- C. east in west longitude and west in east longitude
- D. west

Correct answer: A

68. Which radar control reduces weak echoes out to a limited distance from the ship?

- A. The receiver gain control
- B. The sensitivity time control (sea-clutter control)
- C. The brilliance control
- D. The fast time constant (differentiator)

Correct answer: B

69. What kind of pressure systems travel in tropical waves?

- A. High pressure
- B. Low pressure
- C. Terrastatic pressure
- D. Subsurface pressure

Correct answer: B

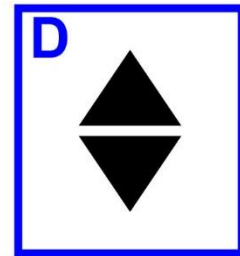
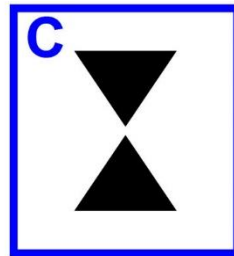
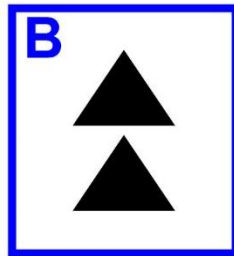
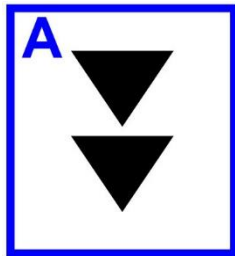
70. What is a system of reservoirs and connecting tubes in a gyro compass called?

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

Correct answer: A



D030NG



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