

U.S.C.G. Merchant Marine Exam

Master of Unlimited Tonnage

Q304 Navigation General – Great Lakes and Inland

(Sample Examination)

Choose the best answer to the following Multiple Choice Questions:

1. Your vessel is proceeding up a channel, and you see a pair of range lights that are in line dead ahead. The chart indicates that the direction of this pair of lights is $283^{\circ}T$, and the variation is $13^{\circ}E$. If the heading of your vessel at the time of the sighting is 278° per standard compass, what is the deviation?
- (A) $5^{\circ}E$
 - (B) $5^{\circ}W$
 - (C) $8^{\circ}E$
 - (D) $8^{\circ}W$

If choice D is selected set score to 1.

2. Which type of cloud formation should be of immediate concern to small craft operators?
- (A) Altostratus
 - (B) Cirrus
 - (C) Cumulonimbus
 - (D) Nimbostratus

If choice C is selected set score to 1.

3. What is the reaction of a gyrocompass to an applied force known as?
- (A) Gravity effect
 - (B) Earth rate
 - (C) Precession
 - (D) Gyroscopic inertia

If choice C is selected set score to 1.

4. In North America, which direction do the majority of the weather systems move?
- (A) From south to north
 - (B) From east to west
 - (C) From north to south
 - (D) From west to east

If choice D is selected set score to 1.

5. A drawbridge may use visual signals to acknowledge a vessel's request to open the draw. Which signal indicates that the draw will NOT be opened immediately?
- (A) A fixed red light
 - (B) A white flag raised and lowered vertically
 - (C) A flashing white light
 - (D) A flashing amber light

If choice A is selected set score to 1.

6. 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) Radio Aids to Navigation (PUB 117)
 - (C) the Coast Pilot
 - (D) the International Code of Signals (PUB 102)

If choice B is selected set score to 1.

7. You are operating on the Illinois River. Which time of day would Heat thunderstorms most likely develop?
- (A) Midday, when the sun is the highest
 - (B) Late afternoon of warm, humid days
 - (C) Warm, humid mornings
 - (D) Extremely hot, dry evenings

If choice B is selected set score to 1.

8. When entering from seaward, what does a buoy displaying a composite group (2+1) flashing red light indicate?
- (A) The starboard side of the secondary channel
 - (B) A junction with the preferred channel to the left
 - (C) A wreck to be left on the vessel's port side
 - (D) A sharp turn in the preferred channel to the right

If choice B is selected set score to 1.

9. Which causes the Earth's irregular heating?
- (A) The seasons
 - (B) The time of day
 - (C) The geography
 - (D) All of the above

If choice D is selected set score to 1.

10. When drawing a weather map and an isobar crosses a front, the isobar is drawn _____.
- (A) kinked and pointing towards the low
 - (B) kinked and pointing away from the low
 - (C) perpendicular to the front
 - (D) kinked and pointing towards the high for a warm front only

If choice B is selected set score to 1.

11. In the U.S. Aids to Navigation System on the Western Rivers, a preferred channel buoy to be left to port while proceeding downstream will _____.

- (A) show a red light if lighted
- (B) have the upper band red
- (C) have a characteristic of composite group flashing if lighted
- (D) All of the above

If choice D is selected set score to 1.

12. When using an echo sounder in deep water, it is NOT unusual to encounter which situation?

- (A) Receiving a first return near the surface during the day, and a strong return at about 200 fathoms (366 meters) at night
- (B) Receiving a strong return at about 200 fathoms (366 meters) during the day, and one nearer the surface at night
- (C) Receiving false echoes at a constant depth day and night
- (D) To have to recalibrate every couple of days due to inaccurate readings

If choice B is selected set score to 1.

13. Where would you expect to find climatological and meteorological tables for the Gulf Coast area?

- (A) In any Coast Pilot volume
- (B) Only at the National Weather Service office
- (C) In the back of Coast Pilot #5
- (D) In the publication entitled Radio Aids to Navigation

If choice C is selected set score to 1.

14. Which publication should you check for complete information on Puget Sound weather conditions?

- (A) Light List
- (B) Chart of the area
- (C) Sailing Directions
- (D) Coast Pilot

If choice D is selected set score to 1.

15. Which publication(s) must a towing vessel of 12 meters or more in length carry when operating on US waters other than the Western Rivers?

- (A) Tide Tables and Tidal Current Tables
- (B) US Coast Pilot(s)
- (C) Notice to Mariners
- (D) All of the above

If choice D is selected set score to 1.

16. Under the IALA Buoyage Systems, what will a spherical buoy mark?

- (A) The position of an underwater cable
- (B) A hazard to navigation
- (C) Safe water
- (D) The port side of the channel

If choice C is selected set score to 1.

17. The Coast Guard Captain of the Port has excluded all traffic from a section of a port, while a regatta is taking place. Which describes the buoys marking this exclusion area?

- (A) A yellow can
- (B) Marked with a spherical topmark
- (C) An orange and white can
- (D) A nun- or can-shaped to conform to the overall direction of navigation

If choice C is selected set score to 1.

18. Which of the listed properties does warm air possess?

- (A) Atmospheric pressure rises as warm air rises
- (B) It rises above cooler air and cools as it rises
- (C) Moisture in warm air condenses as the air is heated
- (D) Warm air that has cooled will develop low pressure areas

If choice B is selected set score to 1.

19. In which source could you find the vertical clearance of a bridge on the Ohio River?

- (A) Notice to Mariners
- (B) Coast Pilot of the Gulf of Mexico
- (C) Light List of the Mississippi River System
- (D) Great Lakes Pilot

If choice C is selected set score to 1.

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

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

If choice D is selected set score to 1.

21. You are sailing south on the Intracoastal Waterway (ICW) when you sight a red nun buoy with a yellow square painted on it. Which of the following is TRUE?

- (A) The yellow square is in error and it should be a yellow triangle.
- (B) You should leave the buoy on your port hand.
- (C) The yellow is retro-reflective material used to assist in sighting the buoy at night.
- (D) This buoy marks the end of the ICW in that geographic area.

If choice B is selected set score to 1.

22. A position obtained by applying ONLY your vessel's course and speed to a known position is a _____.

- (A) dead-reckoning position
- (B) fix
- (C) probable position
- (D) running fix

If choice A is selected set score to 1.

23. The winds of the "roaring forties" are strongest near which latitude?

- (A) 40°N
- (B) 50°N
- (C) 40°S
- (D) 50°S

If choice D is selected set score to 1.

24. What does a white buoy with an orange circle marked on it indicate?

- (A) Vessels are excluded from the area
- (B) Danger
- (C) A mooring buoy
- (D) Operating restrictions are in effect

If choice D is selected set score to 1.

25. You are to sail from Elizabethport, NJ, on 22 May 1983 with a maximum draft of 28 feet. You will pass over an obstruction in the channel near Sandy Hook that has a charted depth of 27 feet. The steaming time from Elizabethport to the obstruction is 1h 40m. What is the earliest time (ZD +4) you can sail on the afternoon of 22 May and pass over the obstruction with 3 feet of clearance?

- (A) 1407
- (B) 1331
- (C) 1303
- (D) 1242

If choice A is selected set score to 1.

26. The nominal range of a light may be accurately defined as the maximum distance at which a light may be seen _____.

- (A) with fifteen miles visibility
- (B) under perfect visibility
- (C) under existing visibility conditions
- (D) with ten miles visibility

If choice D is selected set score to 1.

27. Which item contains information about temporary, short term changes affecting the safety of navigation in U.S. waters?

- (A) Summary of Corrections
- (B) Local Notice to Mariners
- (C) Daily Memorandum
- (D) HYDROLANT or HYDROPAC broadcasts

If choice B is selected set score to 1.

28. The Light List indicates that a dayboard is a type KGW. You should take which action?

- (A) Pass it close aboard on either side
- (B) Leave it to port when southbound on the Atlantic Coast ICW
- (C) Look for another daymark to form the range
- (D) Look for a green and white diamond

If choice C is selected set score to 1.

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

If choice B is selected set score to 1.

30. 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) Northeast of the observer
- (B) West-southwest of the observer
- (C) South-southeast of the observer
- (D) Northwest of the observer

If choice A is selected set score to 1.

31. Under the IALA-B Buoyage System, which is TRUE of a conical buoy?

- (A) The buoy is red in color
- (B) The buoy should be left to port when entering from seaward
- (C) The buoy is numbered with an odd number
- (D) All of the above

If choice A is selected set score to 1.

32. The term "flood current" refers to that time when the water _____.

- (A) is moving towards the ocean
- (B) level is rising because of heavy rains
- (C) is flowing towards the land
- (D) level is not changing

If choice C is selected set score to 1.

33. In which situation is the light characteristic of composite group flashing (2 + 1) used in the Aids to Navigation System on the Western Rivers?

- (A) Only to identify the right descending bank
- (B) Only to identify the left descending bank
- (C) On daymarks with no lateral significance
- (D) On preferred-channel buoys

If choice D is selected set score to 1.

34. While underway you sight a light 11° on your port bow at a distance of 12 miles. Assuming you make good your course, what will be your distance off the light when abeam?

- (A) 2.3 miles
- (B) 3.9 miles
- (C) 4.5 miles
- (D) 3.1 miles

If choice A is selected set score to 1.

35. On an Army Corps of Engineers navigation map, how is each mile A.H.P. on the Lower Mississippi River marked?

- (A) A number showing mileage only
- (B) A navigation light
- (C) A black dot
- (D) A dashed red line

If choice C is selected set score to 1.

36. You wish to check the deviation of your standard magnetic compass. You find a natural range that you steer for and note that the gyrocompass heading is 034° , and the heading by standard magnetic compass is 026° . The gyro error is 1°W . Variation is 9°E . What is the deviation for that heading?

- (A) 2°W
- (B) 0°
- (C) 2°E
- (D) 9°E

If choice A is selected set score to 1.

37. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's fog horn 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

If choice C is selected set score to 1.

38. How can the accuracy of an azimuth circle be checked?

- (A) Sighting a terrestrial range in line and comparing the observed bearing against the charted bearing
- (B) Aligning the relative bearing markings so that 000° is on the lubber's line and the line of sight passes over the center of the compass
- (C) Comparing observed azimuths at different altitudes with computed values at the times of observation to see if the difference is constant
- (D) Ensuring that the alignment marks on the inner face of the circle are in line with those on the repeater on relative bearings of 000° and 090°

If choice C is selected set score to 1.

39. Which corrector will compensate for the deviation which is maximum on intercardinal compass headings?

- (A) Fore-and-aft magnets
- (B) Transverse magnets
- (C) Flinders bar
- (D) Quadrantal spheres

If choice D is selected set score to 1.

40. The true course between two points is 312° . Your gyrocompass has an error of 3°W . You make an allowance of 4° leeway for a west by south wind. What gyro course should be steered to make the true course good?

- (A) 305°pgc
- (B) 318°pgc
- (C) 315°pgc
- (D) 311°pgc

If choice D is selected set score to 1.

41. Your vessel is making way through the water at a speed of 12 knots. Your vessel traveled 30 nautical miles in 2 hours 20 minutes. What current are you experiencing?

- (A) A following current with a drift of 0.4 knot
- (B) A head current with a drift of 0.4 knots
- (C) A head current with a drift of 0.9 knot
- (D) A following current with a drift of 0.9 knots

If choice A is selected set score to 1.

42. Where would you find information about the time of high tide at a specific location on a particular day of the year?

- (A) Nautical Almanac
- (B) Coast Pilot
- (C) Tide Tables
- (D) Tidal Current Tables

If choice C is selected set score to 1.

43. What does the abbreviation L.W.R.P. on the navigation maps mean?

- (A) Low water reference plane
- (B) Low winter runoff point
- (C) Land wall reference point
- (D) Least water river plane

If choice A is selected set score to 1.

44. When does a Doppler speed log indicate speed over ground?

- (A) When sensing the bottom in depths of less than 600 feet
- (B) When the unit is in the volume reverberation mode
- (C) The unit can only sense speed over ground when there is no current
- (D) At all times

If choice A is selected set score to 1.

45. A mid-channel buoy, may show which light?

- (A) A fixed red light
- (B) A Morse (A) white light
- (C) A flashing red light
- (D) An occulting green light

If choice B is selected set score to 1.

46. What is the light phase characteristic of a lighted isolated-danger mark?

- (A) Interrupted quick flashing
- (B) Long flashing
- (C) Very quick flashing
- (D) Group flashing

If choice D is selected set score to 1.

47. The vertical distance from the tidal datum to the level of the water is the _____.

- (A) range of tide
- (B) actual water depth
- (C) height of tide
- (D) charted depth

If choice C is selected set score to 1.

48. You want to transit Pollock Rip Channel, MA, on 6 April 1983. What is the period of time around the 0955 (ZD +5) slack in which the current does not exceed 0.3 knot?

- (A) 0911 to 0955
- (B) 0940 to 1010
- (C) 0935 to 1017
- (D) 0955 to 1044

If choice C is selected set score to 1.

49. Where can information about the currents for the Pacific Coast of the U. S. be obtained?

- (A) Tide Tables
- (B) Nautical Almanac
- (C) Tidal Current Tables
- (D) Ocean Current Tables

If choice C is selected set score to 1.

50. Barometer readings in weather reports are given in terms of pressure at which reference location?

- (A) The broadcasting station
- (B) Washington, D.C.
- (C) The weather station
- (D) Sea level

If choice D is selected set score to 1.

51. Your vessel is entering port when you change course and steady up on a range with the lights in line. After a few minutes you observe the range lights as shown in illustration D047NG below. How should your heading be altered?

- (A) Left, and when the range lights are in line again, steer to keep them in line fine on the starboard bow
- (B) Right, and when the range lights are in line again, steer to keep them in line fine on the port bow
- (C) Left, and when the range lights are in line again, resume your original heading
- (D) Right, and when the range lights are in line again, steer to keep them dead ahead

If choice A is selected set score to 1.

52. Which is TRUE of a nun buoy in the IALA Region B system of buoyage?

- (A) It will have an even number
- (B) It will be green in color
- (C) It will be cylindrical in shape
- (D) It will be left to port when entering from seaward

If choice A is selected set score to 1.

53. Which radar control is used to reduce sea return at close ranges?

- (A) Sensitivity time control
- (B) Gain control
- (C) Pulse length control
- (D) Fast time constant

If choice A is selected set score to 1.

54. Your vessel is steering 143°T at 16 knots. At 2147 a light bears 106°T and at 2206 the same light bears 078°T. What will be your distance off when abeam?

- (A) 5.1 miles
- (B) 5.4 miles
- (C) 5.9 miles
- (D) 6.5 miles

If choice C is selected set score to 1.

55. Which radar control shortens all echoes on the display and reduces clutter caused by rain or snow?

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

If choice D is selected set score to 1.

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

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

If choice C is selected set score to 1.

57. How is the intensity of a light expressed in the Light Lists?

- (A) Nominal range
- (B) Geographic range
- (C) Meteorological range
- (D) Luminous range

If choice A is selected set score to 1.

58. You take a bearing of 176° of a lighthouse. Which bearing of another object would give the best fix?

- (A) 079°
- (B) 151°
- (C) 176°
- (D) 292°

If choice A is selected set score to 1.

59. If the current and wind are in opposite directions, what does the sea surface indicate?

- (A) The surface indicates a lower wind speed than what really exists
- (B) The surface does not change, each cancels the other
- (C) The surface indicates a higher wind speed than what really exists
- (D) The surface indicates a greatly reduced wind speed

If choice C is selected set score to 1.

60. Steam fog is most likely to occur on the Mississippi and Ohio Rivers in _____.

- (A) fall, around midday
- (B) spring, around early evening
- (C) summer, around early morning
- (D) spring, around late evening

If choice C is selected set score to 1.

61. Which theoretical minimum number of measurements from satellites does a GPS receiver need in order to provide an exact three-dimensional position?

- (A) Five
- (B) Four
- (C) Three
- (D) Two

If choice B is selected set score to 1.

62. When a light is first seen on the horizon it will disappear again if the height of eye is immediately lowered several feet. When the eye is raised to its former height the light will again be visible. Which term is given to this process?

- (A) Bobbing a light
- (B) Checking a light
- (C) Raising a light
- (D) Obscuring a light

If choice A is selected set score to 1.

63. Which of the buoys listed below could be used to mark an anchorage?

- (A) White buoy with a green top
- (B) White buoy with orange bands
- (C) White buoy numbered "3"
- (D) Yellow buoy lettered "N"

If choice D is selected set score to 1.

64. What will be the time after 0600 (ZD +3), on 6 March 1983, that the height of the tide at Puerto Rosales, Argentina, will be 9.0 feet (2.7 meters)?

- (A) 0740
- (B) 0754
- (C) 0840
- (D) 0922

If choice D is selected set score to 1.

65. The owner or Master of a towing vessel shall ensure that each person that directs and controls the movement of the vessel can accomplish all of the following EXCEPT _____.

- (A) adjust speed with due regard for the weather and visibility
- (B) evaluate the danger of each closing visual or radar contact
- (C) reduce speed only where local speed limits are posted
- (D) enter all required test and inspection results in the vessel's log or other record carried on board

If choice C is selected set score to 1.

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

- (A) blue
- (B) purple
- (C) yellow
- (D) orange

If choice C is selected set score to 1.

67. Which is TRUE of a dead reckoning (DR) plot?

- (A) A dead reckoning (DR) plot must utilize magnetic courses
- (B) A dead reckoning (DR) plot must take set and drift into account
- (C) A dead reckoning (DR) plot should be replotted hourly
- (D) A dead reckoning (DR) plot should be started each time the vessel's position is fixed

If choice D is selected set score to 1.

68. You are underway on course $160^{\circ}T$ at 10 knots. The current is $210^{\circ}T$ at 0.9 knots. What is the speed being made good?

- (A) 10.7 knots
- (B) 11.0 knots
- (C) 11.6 knots
- (D) 12.3 knots

If choice A is selected set score to 1.

69. What will be the velocity of the tidal current at Port Jefferson Harbor Entrance, NY, at 1600 EST (ZD +5) on 23 December 1983?

- (A) 0.9 knot
- (B) 1.1 knots
- (C) 1.6 knots
- (D) 2.0 knots

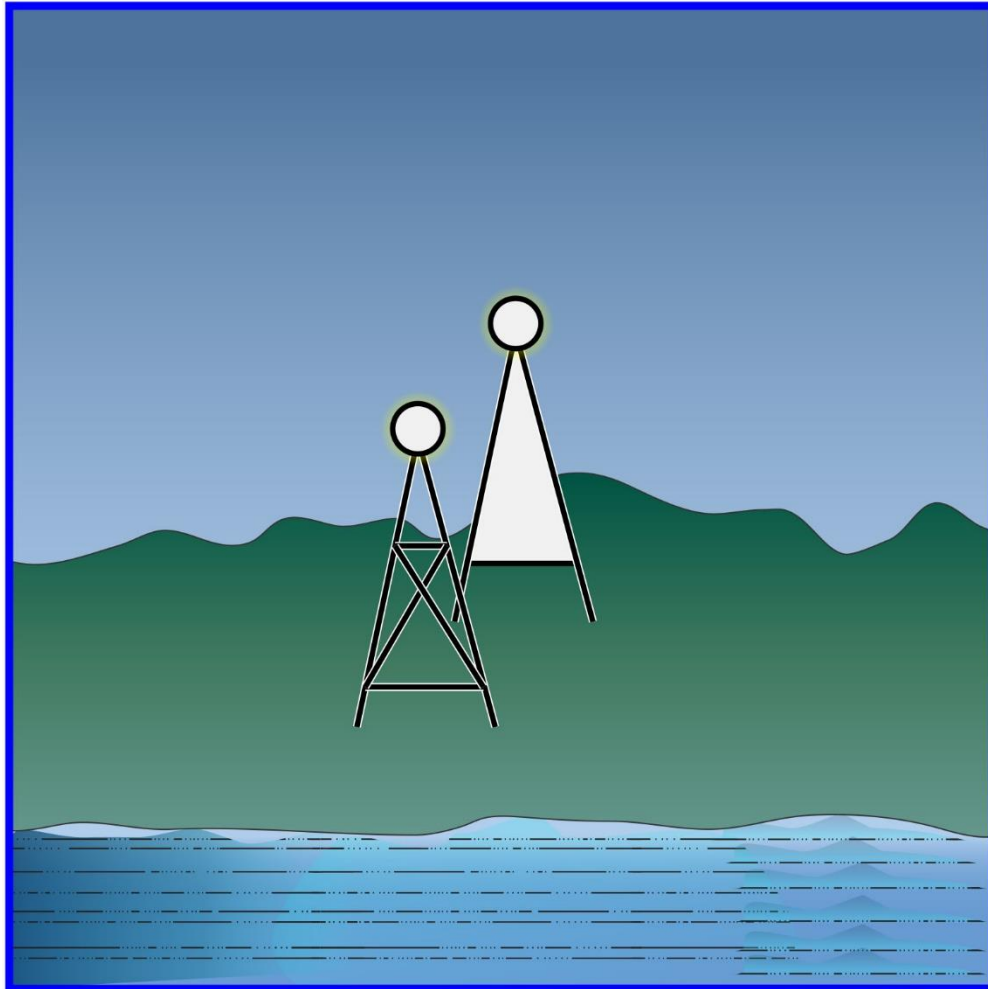
If choice B is selected set score to 1.

70. 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) American Practical Navigator
- (C) Nautical Chart Catalog
- (D) U.S. Coast Pilot

If choice A is selected set score to 1.

D047NG



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