

U.S.C.G. Merchant Marine Exam

Mate of Unlimited Tonnage

Q310 Navigation General - Great Lakes and Inland

(Sample Examination)

Choose the best answer to the following Multiple Choice questions.

1. 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 ship toward the light
 - (B) Geographical positions outlining the area of the sector
 - (C) True bearings as observed from the light toward the ship
 - (D) An outline of the area of the sector

If choice A is selected set score to 1.

2. What will be the time (ZD +5) of the second high tide at Weymouth Fore River Bridge, MA, on 12 November 1983?
- (A) 1639
 - (B) 1643
 - (C) 1647
 - (D) 1650

If choice D is selected set score to 1.

3. You are steaming on a course of 198°T at 18.5 knots. At 0316 you observe a lighthouse bearing 235°T . At 0348 the lighthouse bears 259°T . What is your distance off at the second bearing?
- (A) 16.3 miles
 - (B) 15.3 miles
 - (C) 14.8 miles
 - (D) 15.8 miles

If choice C is selected set score to 1.

4. On the Mississippi and Ohio Rivers, there is a special type of fog known as steam fog. What conditions cause this fog?
- (A) A rapid cooling of the ground on a clear night
 - (B) Warm air passing over much colder water
 - (C) Cold air passing over much warmer water
 - (D) Rain coming out of a warm air mass aloft

If choice C is selected set score to 1.

5. Which clouds are described as uniform, grayish-white cloud sheets that cover large portions of the sky, and are responsible for a large percentage of the precipitation in the temperate latitudes?
- (A) cirrostratus
 - (B) altostratus
 - (C) cirrocumulus
 - (D) altocumulus

If choice B is selected set score to 1.

6. The velocity of a rotary tidal current will be decreased when the Moon is at which phase?
- (A) Apogee
 - (B) New
 - (C) Perigee
 - (D) Full

If choice A is selected set score to 1.

7. You are steaming southward along the west coast of the United States when you sight a buoy showing a flashing green light. How should you pass this buoy?
- (A) Pass it on either side but well clear of it.
 - (B) Leave it to your port.
 - (C) Leave it to your starboard.
 - (D) Pass it close aboard on either side.

If choice C is selected set score to 1.

8. Which of the following describes the principal purpose of magnetic compass adjustment?
- (A) To reduce the magnetic dip as much as possible
 - (B) To reduce the deviation as much as possible
 - (C) To allow the compass bowl to swing freely on its gimbals
 - (D) To reduce the variation as much as possible

If choice B is selected set score to 1.

9. You are in charge of a power-driven vessel crossing a river on the Western Rivers. You must keep out of the way of _____.
- (A) a power-driven vessel ascending the river
 - (B) a sail vessel descending the river
 - (C) a vessel restricted in its ability to maneuver crossing the river
 - (D) All of the above

If choice D is selected set score to 1.

10. What publication contains descriptions of the coast line, buoyage systems, weather conditions, port facilities, and navigation instructions for the United States and its possessions?

- (A) Port Index
- (B) Light List
- (C) Sailing Directions
- (D) Coast Pilots

If choice D is selected set score to 1.

11. What describes a flood current?

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

If choice D is selected set score to 1.

12. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's fog horn 4 1/2 seconds after the signal was sounded. What is the distance to the shore?

- (A) 405 yards
- (B) 628 yards
- (C) 730 yards
- (D) 825 yards

If choice D is selected set score to 1.

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

If choice D is selected set score to 1.

14. Which item in illustration D034NG below shows a fixed and flashing light?

- (A) A
- (B) B
- (C) C
- (D) D

If choice A is selected set score to 1.

15. What color lights do lighted information markers display?

- (A) White lights
- (B) Green lights
- (C) Yellow lights
- (D) Red lights

If choice A is selected set score to 1.

16. The luminous range of a light takes into account which factor?

- (A) The observer's height of eye
- (B) The elevation of the light
- (C) The existing visibility conditions
- (D) The glare from background lighting

If choice C is selected set score to 1.

17. Your radar is set on a true motion display. Which of the following will appear to move across the PPI scope?

- (A) Echoes from land masses
- (B) Own ship's marker
- (C) Echo from a ship at anchor
- (D) All of the above

If choice B is selected set score to 1.

18. Which publication contains information on Naval Cooperation and Guidance for Shipping (NCAGS) in time of emergency or war?

- (A) Pub. 117, Radio Navigational Aids
- (B) Appropriate volume of the Sailing Directions
- (C) Light List
- (D) Pub. 102, International Code of Signals

If choice A is selected set score to 1.

19. In the IALA Maritime Buoyage System, what is a red and white vertically-striped buoy used to indicate?

- (A) Preferred channel
- (B) A special mark not primarily used for navigation
- (C) Isolated danger
- (D) Safe water

If choice D is selected set score to 1.

20. Which publication would describe the explosive anchorages in the ports on the east coast of the United States?

- (A) Coast Pilot
- (B) Pilot Rules for Inland Waters
- (C) Sailing Directions
- (D) Notice to Mariners

If choice A is selected set score to 1.

21. Where are buoys and day beacons exhibiting a yellow triangle or square painted on them used?

- (A) On isolated stretches of the ICW to mark undredged areas
- (B) Locations where the ICW and other waterways coincide
- (C) In minor harbors where the controlling depth is 10 feet (3 meters) or less
- (D) Only at particularly hazardous turns of the channel

If choice B is selected set score to 1.

22. What will be the velocity of the tidal current 4.5 miles east of Smith Point, VA, at 0630 DST (ZD +4) on 6 May 1983?

- (A) 0.3 knot
- (B) 0.5 knot
- (C) 0.7 knot
- (D) 1.0 knot

If choice A is selected set score to 1.

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

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

If choice A is selected set score to 1.

24. A psychrometer has two thermometers that provide dry bulb and wet bulb temperatures. What can be determined by comparing these two temperature readings with a set of tables?

- (A) wind speed
- (B) relative humidity and dew point
- (C) atmospheric pressure
- (D) wind chill factor

If choice B is selected set score to 1.

25. At what time after 1400 EST (ZD +5), on 4 January 1983, will the height of the tide at Port Wentworth, GA, be 3.0 feet?

- (A) 1612
- (B) 1630
- (C) 1653
- (D) 1718

If choice C is selected set score to 1.

26. Your vessel is on a course of 103°T at 14 knots.

At 1918 a light bears 129.5°T, and at 1937 the light bears 148°T.

At what time and at what distance off will your vessel be when abeam of the light?

- (A) 1953, 3.8 miles
- (B) 1947, 2.8 miles
- (C) 1956, 4.4 miles
- (D) 1950, 3.2 miles

If choice C is selected set score to 1.

27. Which is a weekly publication advising mariners of important matters affecting navigational safety?

- (A) Notice to Mariners
- (B) Sailing Directions
- (C) Light List
- (D) Coast Pilot

If choice A is selected set score to 1.

28. Relative humidity is the percentage of water vapor that is in the air as compared to the maximum amount it can hold at _____.

- (A) a specific temperature
- (B) any time
- (C) a specific barometric pressure
- (D) a specific wing speed

If choice A is selected set score to 1.

- 29.** To make sure of getting the full advantage of a favorable current, you should reach an entrance or strait at which time in relation to the predicted time of the favorable current?
- (A) One hour after
 - (B) 30 minutes before
 - (C) 30 minutes before flood, one hour after an ebb
 - (D) At the predicted time

If choice B is selected set score to 1.

- 30.** If your vessel were proceeding up river (ascending), how is the port side of the channel marked according to the U. S. Aids to Navigation System on the Western Rivers?
- (A) Green can buoys
 - (B) Red can buoys
 - (C) Green nun buoys
 - (D) Red nun buoys

If choice A is selected set score to 1.

- 31.** You have been informed that dredging operations may be underway in your vicinity. Which buoy indicates the dredging area?
- (A) White buoy with a green top
 - (B) White and international orange buoy
 - (C) Yellow buoy
 - (D) Yellow and black vertically striped buoy

If choice C is selected set score to 1.

- 32.** What should you apply to a fathometer reading to determine the depth of water?
- (A) Add the draft of the vessel.
 - (B) Add the sea water correction.
 - (C) Subtract the sea water correction.
 - (D) Subtract the draft of the vessel.

If choice A is selected set score to 1.

- 33.** 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 should be replotted hourly
 - (C) A dead reckoning (DR) plot must take set and drift into account
 - (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.

34. The predicted time that the flood begins at the entrance to Delaware Bay is 1526. You are anchored off Chestnut St. in Philadelphia. If you get underway bound for sea at 1600 and turn for 8 knots, at what point will you lose the ebb current?

- (A) Mile 52
- (B) Marcus Hook
- (C) Mile 63
- (D) Billingsport

If choice C is selected set score to 1.

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

- (A) The moon
- (B) The solar system
- (C) The sun
- (D) The oceans

If choice C is selected set score to 1.

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

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

If choice D is selected set score to 1.

37. The owner or Master of a towing vessel shall ensure that each person that directs and controls the movement of the vessel can accurately fix the vessel's position using all of the following EXCEPT _____.

- (A) depths soundings and hydrographic contour lines
- (B) installed navigational equipment
- (C) all available aids to navigation
- (D) buoys alone

If choice D is selected set score to 1.

38. What do the numbers on isobars indicate?

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

If choice C is selected set score to 1.

39. Geographic range is the maximum distance at which a light may be seen under which conditions?

- (A) Perfect visibility conditions, limited only by interference from background lighting
- (B) Existing visibility conditions, limited only by the curvature of the Earth
- (C) Existing visibility conditions, limited only by the intensity of the light
- (D) Perfect visibility conditions, limited only by the curvature of the Earth

If choice D is selected set score to 1.

40. Illustration D037NG below represents a movable dam. If there is high water and the wickets are down so that there is an unobstructed navigable pass through the dam, what light(s) will be shown at D if the lock walls and piers are not awash?

- (A) One red light
- (B) Two red lights
- (C) One amber light
- (D) Three red lights

If choice A is selected set score to 1.

41. What is an advantage of the magnetic compass aboard vessels?

- (A) Compass error is negligible at or near the earth's magnetic poles.
- (B) It does not have to be checked as often.
- (C) It is reliable due to its essential simplicity.
- (D) All points on the compass rose are readily visible.

If choice C is selected set score to 1.

42. While steaming on course 280°T, you sight a buoy showing a very quick flashing (VQ) white light well to port. Maintaining course, you sight another buoy showing a quick flashing (Q) white light. How should you pass?

- (A) South of the buoy
- (B) North of the buoy
- (C) West of the buoy
- (D) East of the buoy

If choice B is selected set score to 1.

43. Your vessel is enroute from Japan to Seattle and is located at position I on the weather map in illustration D013NG below. You should experience which weather condition?

- (A) Thundershowers
- (B) Clear skies with warm temperatures
- (C) Overcast skies with rising temperature
- (D) Steady precipitation

If choice A is selected set score to 1.

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

- (A) Check to enter the correct channel at this junction daymark
- (B) Leave it on either side
- (C) Look for an all red daymark
- (D) Look for the other dayboard forming the range

If choice B is selected set score to 1.

45. You wish to make good a course of $258^{\circ}T$, allowing 4° leeway for northerly winds. The variation is $21^{\circ}W$. What should you steer per standard magnetic compass to make good $258^{\circ}T$?

DEVIATION TABLE

Magnetic

Heading Deviation

285°	5°E
270°	3°E
255°	1°E
240°	1°W

- (A) $242^{\circ}psc$
- (B) $271^{\circ}psc$
- (C) $278^{\circ}psc$
- (D) $288^{\circ}psc$

If choice C is selected set score to 1.

46. You are proceeding up a channel at night. It is marked by a range which bears $185^{\circ}T$. You steady up on a compass course of 180° with the range in line dead ahead. This indicates that you(r)

_____.

- (A) course is in error
- (B) must come right to get on the range
- (C) compass has some easterly error
- (D) are being affected by a southerly current

If choice C is selected set score to 1.

47. A position that is obtained by using two or more intersecting lines of position taken at nearly the same time, is a (n) _____.

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

If choice C is selected set score to 1.

48. Which topmark shown in illustration D023NG below identifies an isolated danger?

- (A) A
- (B) B
- (C) C
- (D) D

If choice B is selected set score to 1.

49. 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 014°T , and the variation is 11°E . If the heading of your vessel at the time of the sighting is 009° per standard magnetic compass, what is the correct deviation?

- (A) 5°E
- (B) 5°W
- (C) 6°E
- (D) 6°W

If choice D is selected set score to 1.

50. If the current and wind are in the same direction, what does the sea surface represent concern the true wind speed?

- (A) The appearance of the sea surface does not change
- (B) It appears less than actually exists
- (C) It appears higher than actually exists
- (D) It appears at the correct speed

If choice B is selected set score to 1.

51. When do the prevailing westerlies of the Southern Hemisphere blow 17-27 knots?

- (A) During the winter only
- (B) All year long
- (C) During spring only
- (D) During the summer months only

If choice B is selected set score to 1.

52. 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 left until the range closes, then steer to the left of 306°T .
- (C) Alter course to the right to 309°T or more to bring the range in line.
- (D) Alter course to the left to close the range, then alter course to 309°T .

If choice B is selected set score to 1.

53. Which device maintains a continuous graphic record of the heading of the vessel?

- (A) The course recorder
- (B) The fathometer
- (C) The AIS system
- (D) The auto pilot

If choice A is selected set score to 1.

54. By what means are indications of the master gyrocompass sent to remote repeaters?

- (A) by phantom element
- (B) by follow-up system
- (C) by azimuth motor
- (D) by transmitter

If choice D is selected set score to 1.

55. You should plot your dead reckoning position _____.

- (A) only in pilotage waters
- (B) every three minutes in pilotage waters
- (C) from every fix or running fix
- (D) from every estimated position

If choice C is selected set score to 1.

56. You are on course 344°T and take a relative bearing of a lighthouse of 270°. What is the true bearing to the lighthouse?

- (A) 016°
- (B) 074°
- (C) 090°
- (D) 254°

If choice D is selected set score to 1.

57. Which system provides the highest level of commercial navigational accuracy?

- (A) SPS, without selective availability
- (B) NAVSAT, using the Doppler-shift
- (C) PPS, without selective availability
- (D) DGPS, within a coverage area

If choice D is selected set score to 1.

58. A chart has extensive corrections to be made to it. When these are made and the chart is again printed, what term is given to this chart issue?

- (A) Revised edition
- (B) First edition
- (C) Reprint
- (D) New edition

If choice D is selected set score to 1.

59. As your vessel is heading southward along the east coast of the United States, you encounter a buoy showing a red flashing light. How should you pass this buoy?

- (A) Leave it to your starboard.
- (B) Leave it to your port.
- (C) Pass it well clear on either side.
- (D) Pass it about 50 yards off on either side.

If choice A is selected set score to 1.

60. Which characteristics will a lighted buoy that is to be left to starboard, when entering a U.S. port from seaward have?

- (A) A red light
- (B) A light characteristic of Morse (A)
- (C) A white light
- (D) A green light

If choice A is selected set score to 1.

61. 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 $343^{\circ}T$, and the variation is 5° west. If the heading of your vessel at the time of the sighting is 344° per standard magnetic compass, what is the correct deviation?

- (A) $1^{\circ}E$
- (B) $1^{\circ}W$
- (C) $4^{\circ}E$
- (D) $4^{\circ}W$

If choice C is selected set score to 1.

62. Quadrantal error in a gyrocompass has its GREATEST effect on which of the following?

- (A) When the vessel is on north or south headings
- (B) When the vessel is near the equator
- (C) When the vessel is in high latitudes
- (D) When the vessel is on intercardinal headings

If choice D is selected set score to 1.

63. Which is TRUE concerning privately maintained aids to navigation included in the Light List?

- (A) They must be conspicuously marked by a signboard with the words "PRIVATE AID"
- (B) They must conform to the standards of the U.S. Aids to Navigation System
- (C) Not permitted in or along first-class waterways and may be authorized for second- and third-class waterways
- (D) They are painted white and must use a white light if lighted

If choice B is selected set score to 1.

64. 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

If choice C is selected set score to 1.

65. White and orange buoys, if lighted, show which color light?

- (A) Alternating yellow and white
- (B) Red
- (C) Orange
- (D) White

If choice D is selected set score to 1.

66. The true course between two points is 106° . Your gyrocompass has an error of 2°E and you make an allowance of 2° leeway for a south wind. What gyro course should be steered to make the true course good?

- (A) 108°pgc
- (B) 104°pgc
- (C) 106°pgc
- (D) 102°pgc

If choice C is selected set score to 1.

67. What is the name of the region of high pressure extending around the Earth at about 35°N latitude?

- (A) The horse latitudes
- (B) The prevailing westerlies
- (C) The troposphere
- (D) The doldrums

If choice A is selected set score to 1.

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

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

If choice A is selected set score to 1.

69. What is an ebb current?

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

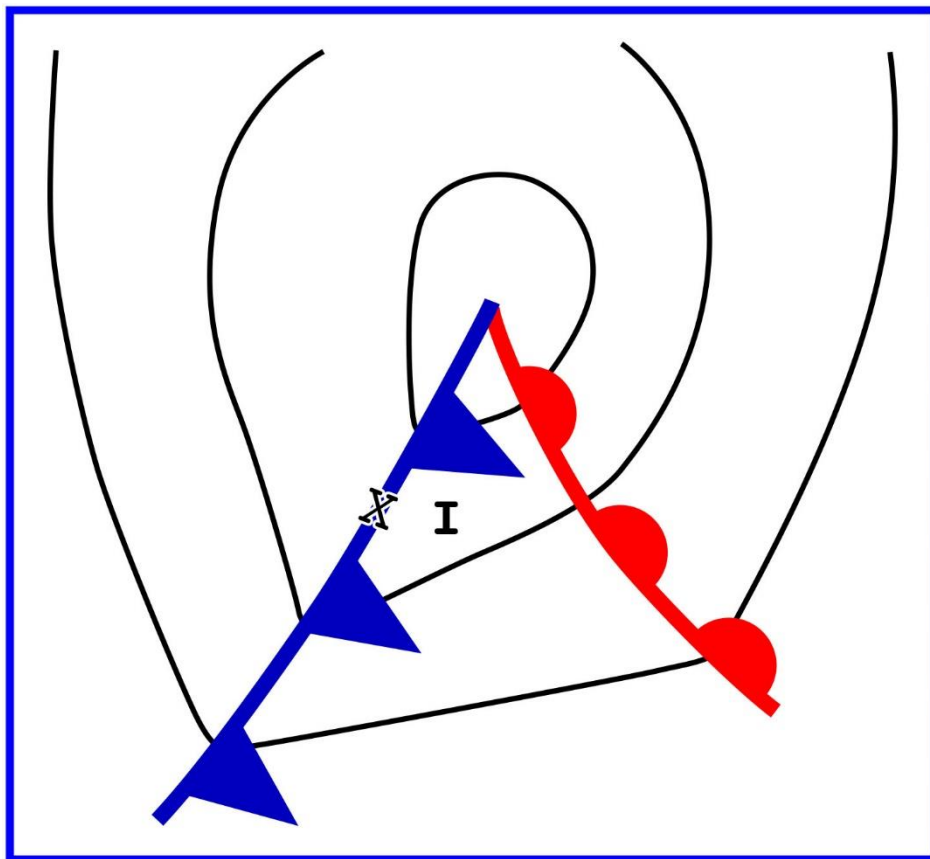
If choice B is selected set score to 1.

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

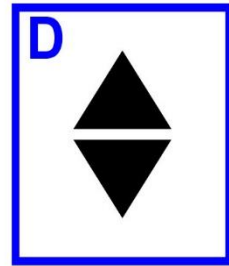
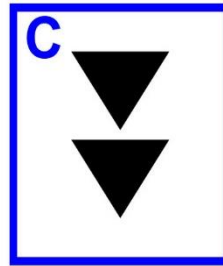
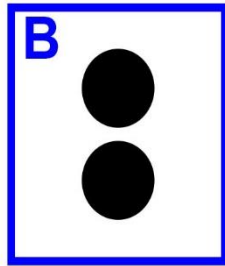
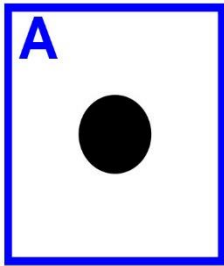
- (A) At all times
- (B) When the unit is in the volume reverberation mode
- (C) The unit can only sense speed over ground when there is no current
- (D) When sensing the bottom in depths of less than 600 feet

If choice D is selected set score to 1.

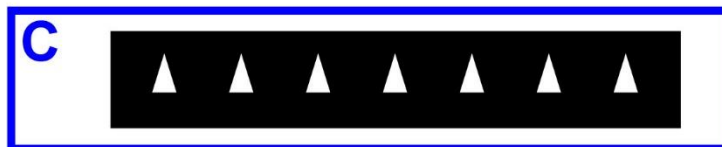
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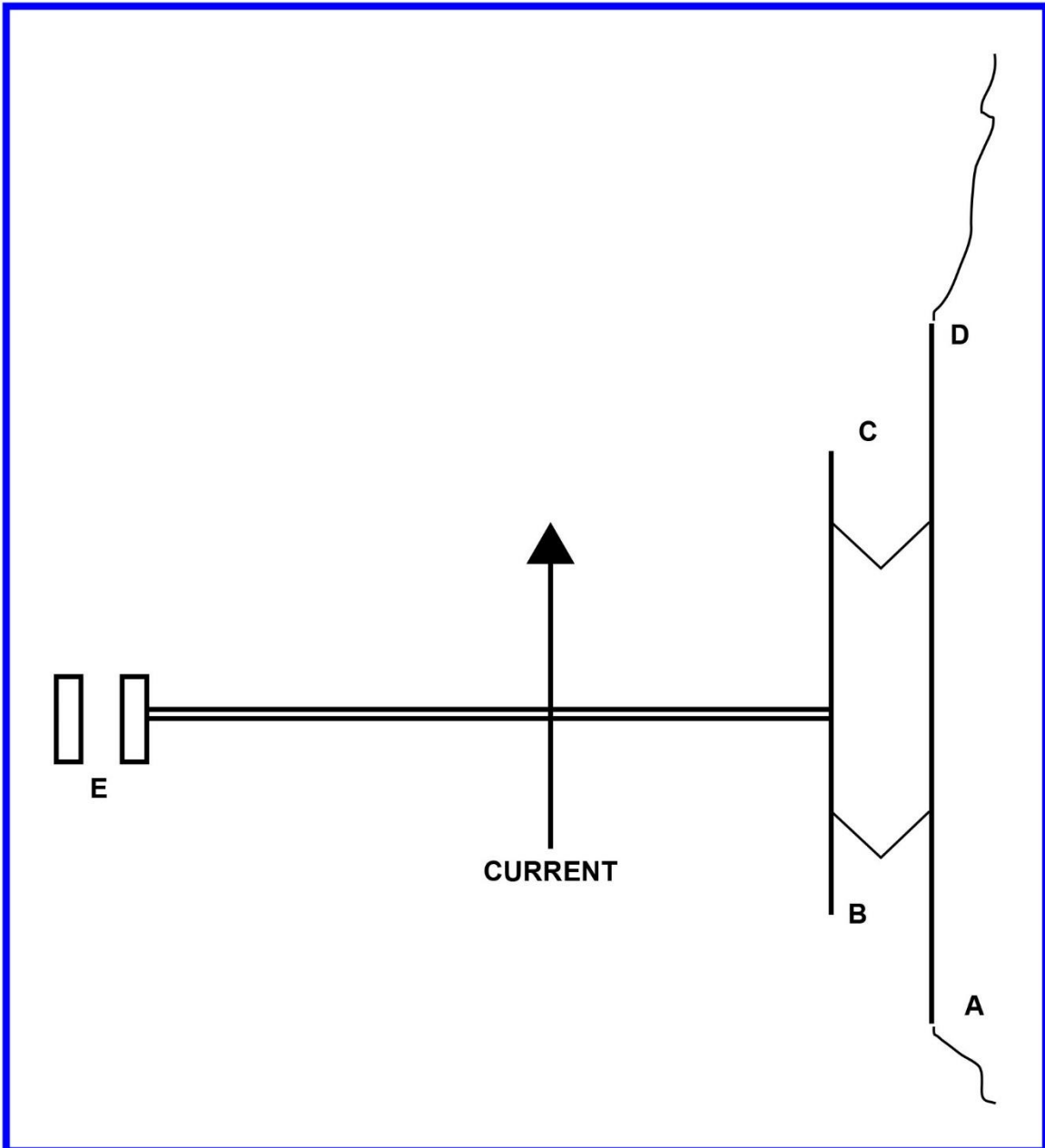
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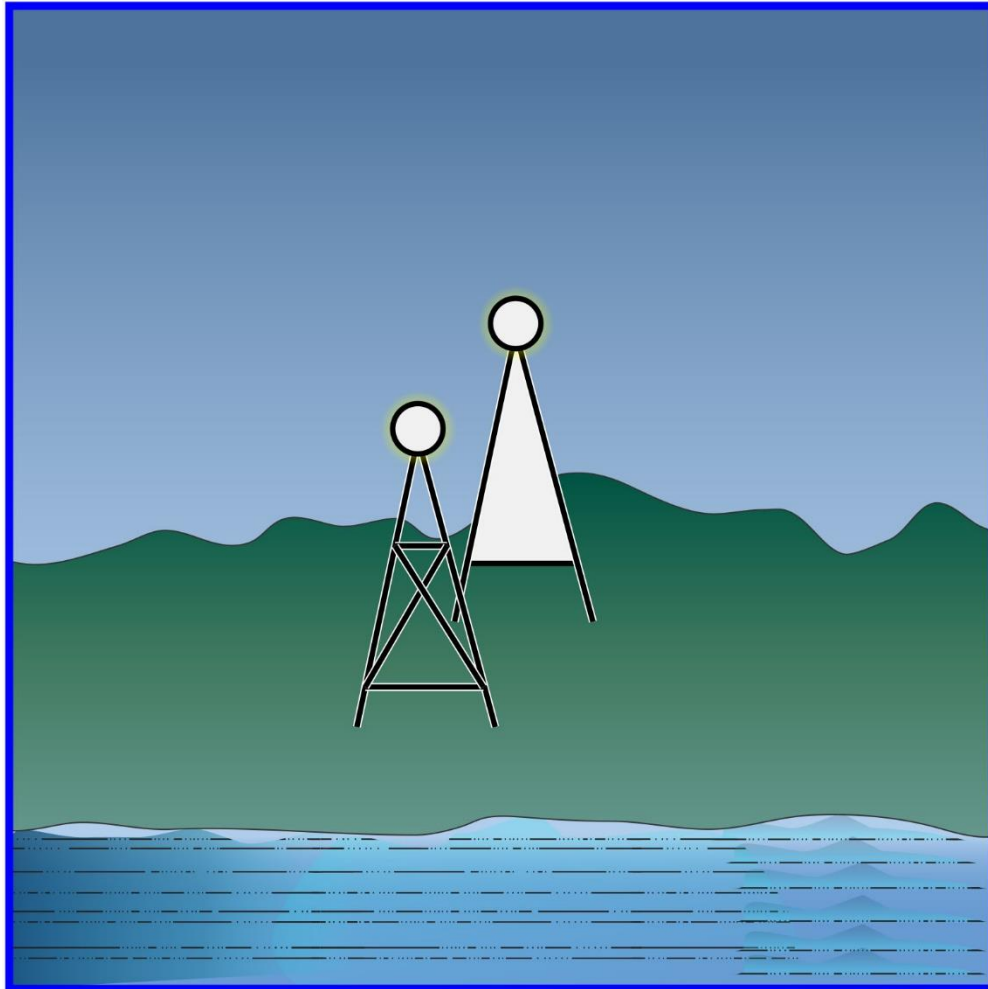
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