

U.S.C.G. Merchant Marine Exam
Master/Chief Mate of Unlimited Tonnage
Q106 Navigation General – Oceans
(Sample Examination)

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

1. Which statement about gyrocompass error is TRUE?
- A. Any error shown by a gyro repeater will be the same as the error of the master compass.
 - B. Any error will remain constant unless the compass is stopped and restarted.
 - C. The sign (E or W) of the error will change with different headings of the ship.
 - D. The amount of the error and the sign will generally be the same on all headings.

Correct answer: D

2. You are outbound in a channel marked by a range astern. The range line is 273°T . You are steering 090°T and have the range in sight as shown in illustration D047NG below. What action should you take?
- A. Come left until the range comes in line then alter course to 093°T .
 - B. Come right to close the range then when on the range steer 093°T .
 - C. Come left until the range comes in line then alter course to 087°T .
 - D. Come right to 093°T .

Correct answer: B

3. You are on course 238°T . To check the course of your vessel you should observe a celestial body on which bearing?
- A. 180°
 - B. 238°
 - C. 328°
 - D. 090°

Correct answer: C

4. The Brazil Current flows in which general direction?
- A. Northerly
 - B. Southeasterly
 - C. Southwesterly
 - D. Northwesterly

Correct answer: C

5. Some lights used as aids to marine navigation have a red sector to indicate a danger area. How are the limits of a colored sector of light listed in the Light List?
- A. Bearings given in the Light List are always magnetic
 - B. True bearings as observed from a vessel toward the light
 - C. True bearings as observed from the light toward a vessel
 - D. Geographical positions outlining the area of the sector

Correct answer: B

6. Which term defines the ocean bottom that extends from the shoreline out to an area where there is a marked change in slope to a greater depth?
- A. Continental shelf
 - B. Offshore terrace
 - C. Borderland
 - D. Abyssal plain

Correct answer: A

7. Which statement is TRUE concerning equatorial tides?
- A. They are used as the basis for the vulgar establishment of the port.
 - B. They occur when the Moon is at maximum declination north or south.
 - C. The difference in height between consecutive high or low tides is at a minimum.
 - D. They occur when the Sun is at minimum declination north or south.

Correct answer: C

8. If a sound signal is emitted from the oscillator of a fathometer, and two seconds elapse before the returning signal is picked up, what depth of water is indicated?
- A. 824 fathoms
 - B. 1248 fathoms
 - C. 1648 fathoms
 - D. 1048 fathoms

Correct answer: A

9. Your vessel is located at position I on the weather map in illustration D013NG below. You should experience which weather condition?
- A. Clear skies with warm temperatures
 - B. Overcast skies with rising temperature
 - C. Thundershowers
 - D. Steady precipitation

Correct answer: C

10. Temperature and moisture characteristics are modified in a warm or cold air mass due to which factor?
- A. Pressure changes in the air mass
 - B. Movement of the air mass
 - C. The heterogeneous nature of the air mass
 - D. Upper level atmospheric changes

Correct answer: B

11. The winds of the "roaring forties" are strongest near which latitude?
- A. 40°N
 - B. 50°S
 - C. 40°S
 - D. 50°N

Correct answer: B

12. How long would a steady wind need to blow in order to create a wind driven current?

- A. 2 hours
- B. 6 hours
- C. 12 hours
- D. 18 hours

Correct answer: C

13. Which is TRUE of the tides in Boston Harbor?

- A. The tides are diurnal in nature
- B. The tides have their variations caused by the changing declination of the Moon
- C. The tides have a greater range than the tides in Gulf Coast ports
- D. All of the above

Correct answer: C

14. Which type of fog occurs on clear nights with very light breezes and forms when the earth cools rapidly?

- A. Radiation fog
- B. Advection fog
- C. Frontal fog
- D. Convection fog

Correct answer: A

15. You are on course 303° T. To check the speed of your vessel you should observe a celestial body on which bearing?

- A. 213°
- B. 000°
- C. 123°
- D. 090°

Correct answer: C

16. 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 $3^{\circ}38.8'$. What is the observed altitude?

- A. Ho $4^{\circ}18.6'$
- B. Ho $4^{\circ}29.1'$
- C. Ho $4^{\circ}36.3'$
- D. Ho $4^{\circ}42.2'$

Correct answer: B

17. Which type of daymark is used to mark the port 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: A

18. 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

19. In United States waters, a buoy having red and white vertical stripes if lighted, it will have which light characteristic?

- A. Quick flashing
- B. Interrupted quick flashing
- C. Morse (A)
- D. Group occulting

Correct answer: C

20. You swung ship and compared the magnetic compass against the gyrocompass to find deviation. Gyro error is 2°E. The variation is 8°W. Find the deviation on a magnetic compass heading of 057°.

NP-0109

HEADING	
PSC	PGC
030.5°	020°
061.5°	050°
092.0°	080°
122.5°	110°
152.0°	140°
181.0°	170°
210.0°	200°
239.5°	230°
269.0°	260°
298.0°	290°
327.5°	320°
358.5°	350°

- A. 1.0°E
- B. 1.5°E
- C. 1.5°W
- D. 0.5°W

Correct answer: C

21. If several navigational lights are visible at the same time, each one may be positively identified by checking all of the following EXCEPT what against the Light List?

- A. Intensity
- B. Color
- C. Rhythm
- D. Period

Correct answer: A

22. Which action is the safest and most prudent procedure to follow while navigating in the vicinity of a tropical cyclone?

- A. Batten down and prepare to ride out the storm
- B. Always navigate towards the coast by the most direct route
- C. Take positive steps to avoid it if possible
- D. Continue to navigate farther from the coast

Correct answer: C

23. When does the effects of priming of the tides occur?

- A. When the Moon is between new and first quarter and between full and third quarter
- B. When the Earth, Moon, and Sun are lying approximately on the same line
- C. At times of new and full Moon
- D. When the Moon is between first quarter and full and between third quarter and new

Correct answer: A

24. Which correction must be applied to an aneroid barometer reading?

- A. Gravity error
- B. Temperature error
- C. Height error
- D. English to metric conversion error

Correct answer: C

25. You are on course $222^{\circ}T$ and take a relative bearing of a lighthouse of 025° . What is the true bearing to the lighthouse?

- A. 197°
- B. 335°
- C. 247°
- D. 315°

Correct answer: C

26. What is the equivalent of 10 min. 52 sec. in arc units?

- A. $0^{\circ}47'$
- B. $1^{\circ}12'$
- C. $2^{\circ}43'$
- D. $3^{\circ}52'$

Correct answer: C

27. You are on course 357°T and take a relative bearing of a lighthouse of 180° . What is the true bearing to the lighthouse?

- A. 227°
- B. 177°
- C. 363°
- D. 003°

Correct answer: B

28. 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 352°T , and the variation is 4°W . If the heading of your vessel at the time of the sighting is 359° per standard magnetic compass, what is the correct deviation?

- A. 3°W
- B. 7°E
- C. 11°E
- D. 11°W

Correct answer: A

29. Which type of current will have the greatest effect on the course made good for your vessel?

- A. A current that flows at nearly right angles to your course steered
- B. A current flowing in the opposite direction as your course steered
- C. A rotary current in which the direction of current flow constantly changes
- D. A current flowing in the same direction as your course steered

Correct answer: A

30. You take a bearing of 264° of a lighthouse. What bearing of another object would give the best fix?

- A. 081°
- B. 350°
- C. 289°
- D. 120°

Correct answer: B

31. On a voyage along the coast of France, you sight a buoy with the top marks as shown in illustration D026NG below. How should you steer your vessel?

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

Correct answer: C

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

_____.

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

Correct answer: A

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

- A. 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
- B. Sighting a terrestrial range in line and comparing the observed bearing against the charted bearing
- C. 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°
- D. Comparing observed azimuths at different altitudes with computed values at the times of observation to see if the difference is constant

Correct answer: D

34. Your vessel is on a course of 343°T at 14 knots.

At 2156 a light bears 320.5°T , and at 2217 the light bears 298°T .

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

- A. 2241, 6.9 miles
- B. 2228, 4.9 miles
- C. 2232, 3.4 miles
- D. 2235, 4.3 miles

Correct answer: C

35. Discounting slip, if your vessel is turning RPM for 10 knots and making good a speed of 10 knots, which is TRUE of the current?

- A. It is slack
- B. It is against you at 10 knots
- C. It is with you at 2 knots
- D. It is with you at 10 knots

Correct answer: A

36. In IALA Region B, entering from sea, how would a daymark on the port side of the channel be indicated on a chart?

- A. A red triangle with the letter R
- B. A white square with the letters GR
- C. A green square with the letter G
- D. A white triangle with the letters RG

Correct answer: C

37. What weather change accompanies the passage of a cold front in the Northern Hemisphere?

- A. Steady dropping of barometric pressure
- B. A line of cumulonimbus clouds
- C. Wind shift from northeast clockwise to southwest
- D. Steady precipitation, gradually increasing in intensity

Correct answer: B

38. A pilot chart does NOT contain information about which item?

- A. Tidal currents
- B. Magnetic variation
- C. Average wind conditions
- D. Average limits of field ice

Correct answer: A

39. 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 barometric pressure
- B. any time
- C. a specific wing speed
- D. a specific temperature

Correct answer: D

40. When is the planet Mars not visible to us?

- A. When Mars is at opposition
- B. When Mars is from quadrature to opposition
- C. When Mars is at conjunction
- D. When Mars is at elongation angles near 180°

Correct answer: C

41. 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

42. What does a slow rise in the barometric pressure forecast?

- A. Rainy weather for the next 48 hours
- B. High seas
- C. Deteriorating weather conditions
- D. Improving weather conditions

Correct answer: D

43. You are enroute to assist vessel A. Vessel A is underway at 5.5 knots on course 033°T, and bears 284°T, 43 miles from you. What is the time to intercept if you make 16 knots?
- A. 2h 16m
 - B. 2h 22m
 - C. 2h 32m
 - D. 2h 42m

Correct answer: C

44. Illustration D011NG below represents the geographic location of a vessel and the radar presentation at the same time. Which statement is TRUE?
- A. Ship No. 1 does not appear as an individual target due to the effect of beam width.
 - B. A tangent bearing of the headland to the south-southeast is corrected by subtracting one-half of the beam width.
 - C. Ship No. 2 is not detected due to the side lobe effect of radar reflecting from the mountain.
 - D. Small island is not detected due to the multiple echo effect from the mountain.

Correct answer: A

45. 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

46. The total magnetic effects which cause deviation of a vessel's compass can be broken down into a series of components which are given which term?
- A. Divisional parts
 - B. Equations
 - C. Fractional parts
 - D. Coefficients

Correct answer: D

47. A towing vessel is NOT required to be fitted with radar if it is _____.
- A. towing alongside
 - B. less than 49 feet in length
 - C. used solely for pollution response
 - D. used occasionally to assist vessels in distress

Correct answer: C

48. When should your dead reckoning position should be plotted?
- A. Whenever an estimated position is plotted
 - B. When it agrees with your GPS position
 - C. When coming on or going off soundings
 - D. At least every hour on the hour in the open waters of the sea

Correct answer: D

49. In order to remove side error from a sextant, which adjustment can be made?
- A. Adjust the horizon glass to make it parallel to the horizon mirror with the index set at zero
 - B. Adjust the horizon glass to make it perpendicular to the sextant frame
 - C. Adjust the telescope to make it parallel to the sextant frame
 - D. Adjust the horizon glass to make it perpendicular to the index mirror with the index set at zero

Correct answer: B

50. Where do you find the semidiameter correction to be used to correct sextant observations of the stars?
- A. A correction of -0.5' should be applied to all star sights.
 - B. It is included in the altitude corrections inside the front cover of the Nautical Almanac.
 - C. Table 25 in Bowditch contains the correction.
 - D. No semidiameter correction is used.

Correct answer: D

51. In the Northern Hemisphere, if your vessel is in a hurricane's navigable semicircle where should you position the wind relative to the vessel?
- A. On the port quarter, maintain course and make as much speed as possible
 - B. On the port bow, hold course and make as much speed as possible until the hurricane has passed
 - C. On the starboard quarter, hold course and make as much speed as possible
 - D. On the starboard bow and heave to until the hurricane has passed

Correct answer: C

52. On the pole side of the high pressure belt in each hemisphere, the pressure diminishes. The winds along these gradients are diverted by the Earth's rotation toward the east. What is the name of these winds?
- A. The northeast trade winds
 - B. The southeast trades
 - C. The geostrophic winds
 - D. The prevailing westerlies

Correct answer: D

53. Which statement about radio navigational warnings is TRUE?
- A. The United States is responsible for NAVAREA warnings in the North Atlantic north of 7°N, and west of 15°W.
 - B. NAVAREA warnings concern only coastal navigation and inland navigation in large bays or sounds such as Puget Sound.
 - C. Long range radio navigational warnings are usually broadcast by radiotelephone, radiotelegraph, and radio-teletypewriter.
 - D. The topics for warnings included in HYDROLANTS, HYDROPACS, and NAVAREA warnings are the same.

Correct answer: D

54. Which Naval Control of Shipping publication should be aboard your vessel?

- A. NWP-14, "Amphibious Operations"
- B. PUB 102, "International Code of Signals"
- C. ATP-2, Volume II "Allied Control of Shipping Manual - Guide to Masters"
- D. ATP-1, Volume II "Allied Tactical Signals"

Correct answer: C

55. Which is TRUE when a high pressure system is centered north of your vessel in the Northern Hemisphere?

- A. The winds should be brisk
- B. The wind direction is generally easterly
- C. The winds should be from the southwest at your position
- D. You should experience hot, moist, clear weather

Correct answer: B

56. On what does the operation of an aneroid barometer depend?

- A. Column of mercury supported by atmospheric pressure
- B. Curved tube containing alcohol
- C. Thin, metal, air tight cell
- D. Expansion of mercury in a closed tube

Correct answer: C

57. A great circle will intersect the equator at how many degrees of longitude apart?

- A. 0°
- B. 45°
- C. 90°
- D. 180°

Correct answer: D

58. Which type of cloud formation should be of immediate concern to small craft operators?

- A. Cirrus
- B. Altostratus
- C. Cumulonimbus
- D. Nimbostratus

Correct answer: C

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

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

Correct answer: B

60. Which is TRUE when using the radar for navigation?

- A. The best fix is obtained by using a tangent bearing and a range
- B. When crossing a radar range of one object with the visual bearing of a second object, the two objects should be 80° to 110° apart
- C. When using two radar ranges for a fix, the objects of the ranges should be close to reciprocal bearings
- D. When using ranges, the most rapidly changing range should be measured first

Correct answer: D

61. When is a revised print of a chart made?

- A. Every two years to update the magnetic variation information
- B. After every major hydrographic survey of the area covered by the chart
- C. When there are numerous corrections to be made or the corrections are extensive
- D. When a low-stock situation occurs and minor corrections are made

Correct answer: D

62. The GP of a body for a high altitude sight is determined from the declination and which other information?

- A. The Greenwich hour angle of the body
- B. The right ascension of the body
- C. The azimuth of the body
- D. The zenith distance of the body

Correct answer: A

63. A great circle crosses the equator at 17°W . It will also cross the equator at what other longitude?

- A. 17°E
- B. 163°E
- C. 117°W
- D. 173°W

Correct answer: B

64. When adjusting a magnetic compass for error, which is TRUE concerning the deviation table?

- A. Construct the deviation table before correcting for any deviation
- B. Construct the deviation table before the quadrantal correctors are placed on the compass
- C. Construct the table after adjusting the fore-and-aft permanent magnets
- D. Construct the deviation table after correcting for variation

Correct answer: C

65. Your vessel is steering course 243°psc . Variation for the area is 5°E , and deviation is 2°W . The wind is from the south-southeast, producing a 2° leeway. What true course are you making good?

- A. 242°T
- B. 244°T
- C. 246°T
- D. 248°T

Correct answer: D

66. How can Northern Right Whales be identified?

- A. "V" shaped blow easily visible from ahead or behind
- B. Whitish patches of skin on top of the head
- C. No dorsal fin on the back
- D. All of the above

Correct answer: D

67. Under the IALA-A Buoyage System, when entering from seaward which buoy as shown in illustration D046NG below, should be left to port?

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

Correct answer: B

68. What feature(s) of a daymark is (are) used to identify the beacon upon which it is mounted?

- A. Color and shape
- B. Signal characteristics
- C. Method of construction
- D. Size

Correct answer: A

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

- A. 209 yards
- B. 363 yards
- C. 480 yards
- D. 730 yards

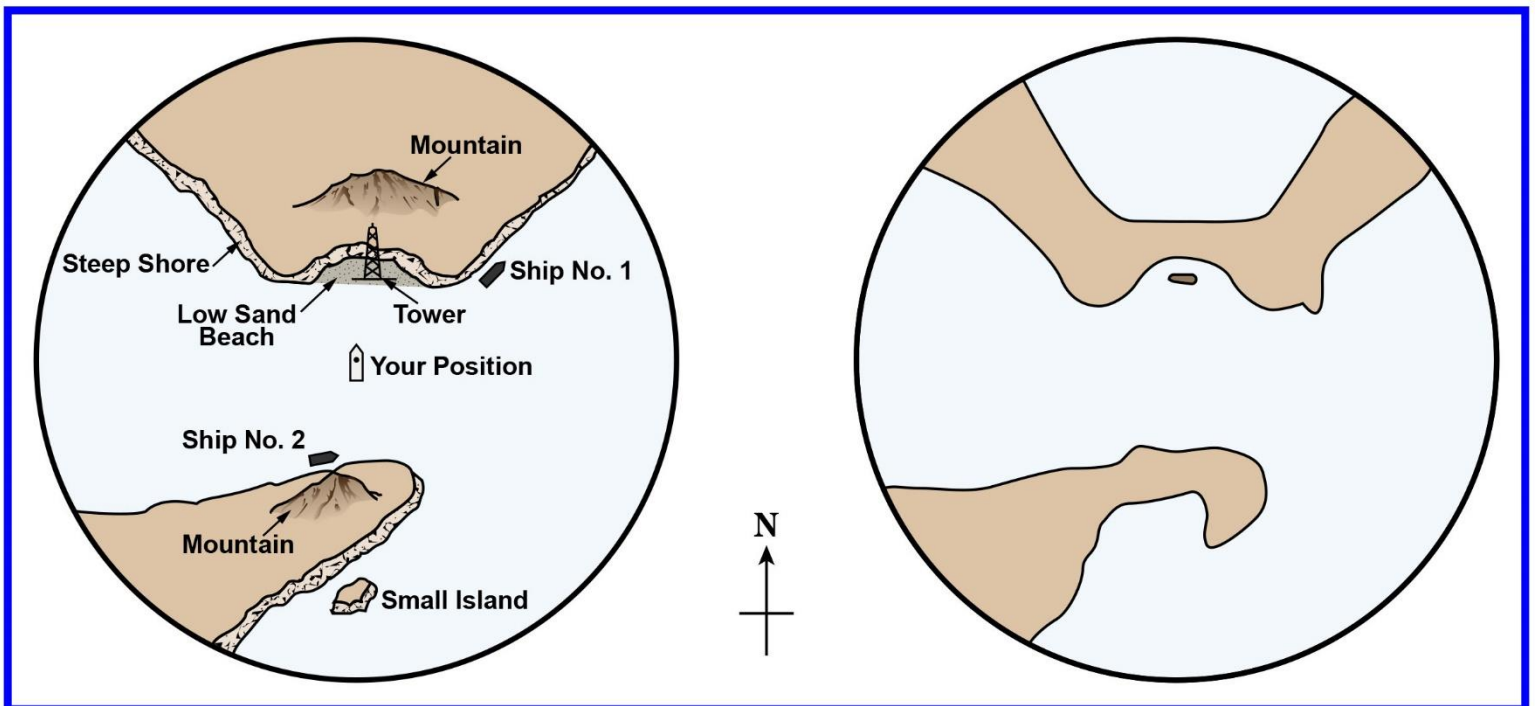
Correct answer: D

70. How is a safe water mark, that can be passed close aboard on either side, painted and lighted?

- A. Black and red stripes with an interrupted quick flashing light
- B. Red and white stripes with a Morse (A) light
- C. Black and red stripes with a Morse (A) light
- D. Black and white stripes with an interrupted quick flashing light

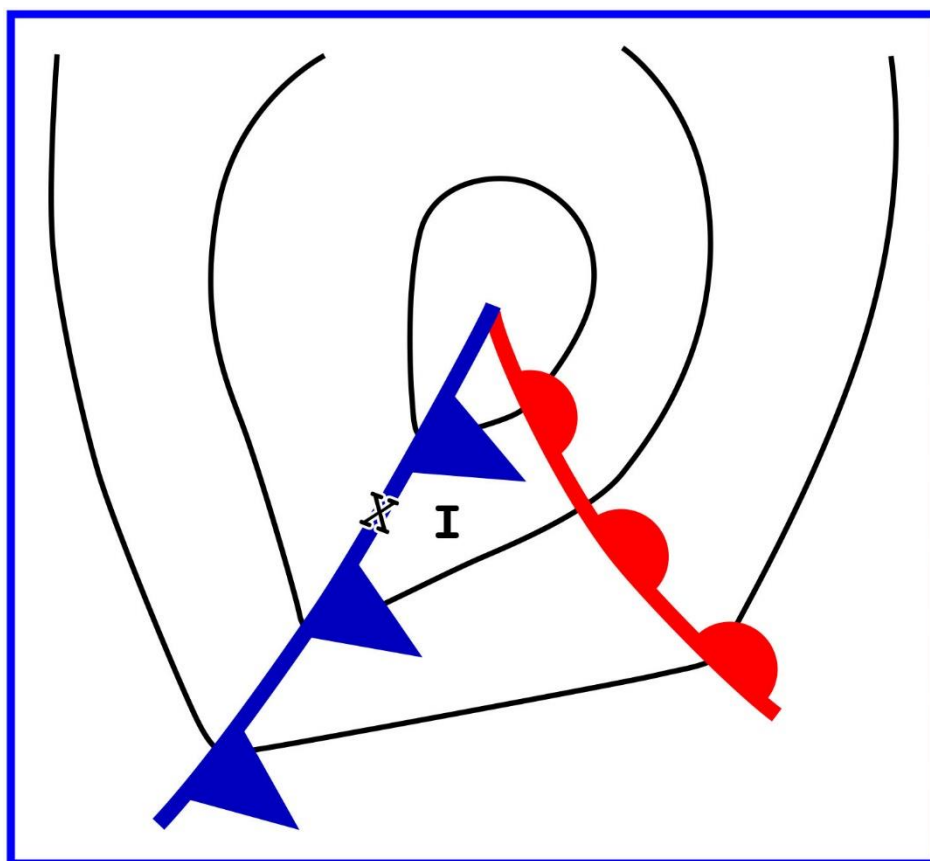
Correct answer: B

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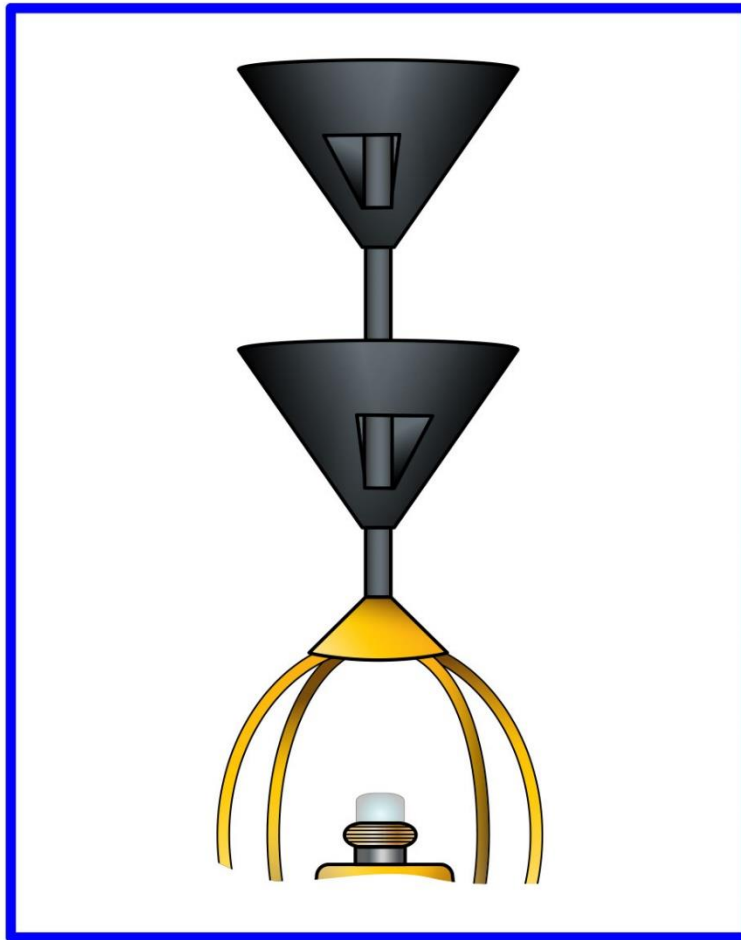
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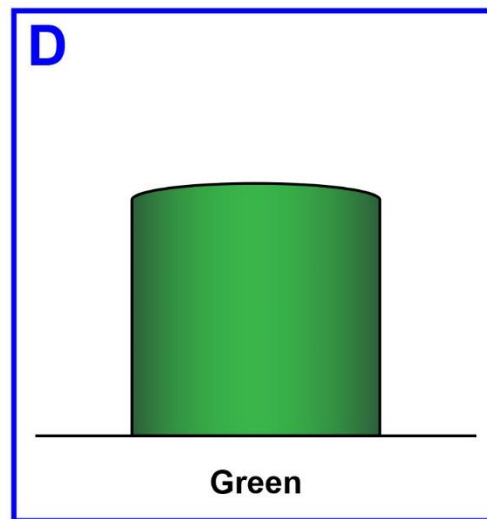
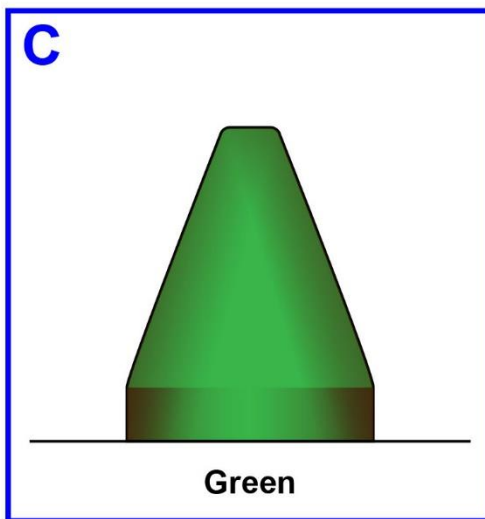
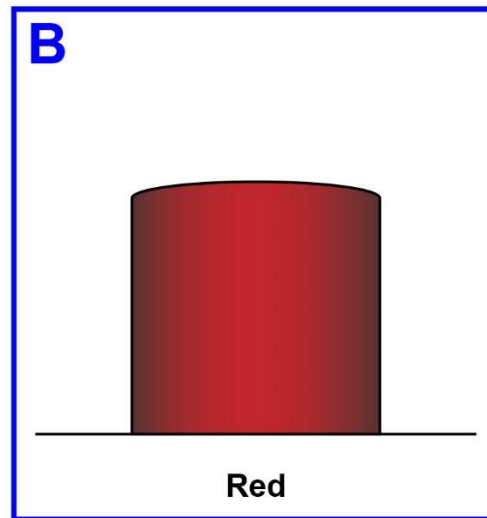
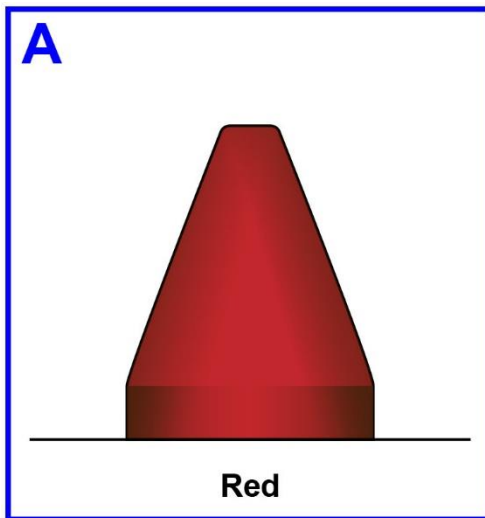
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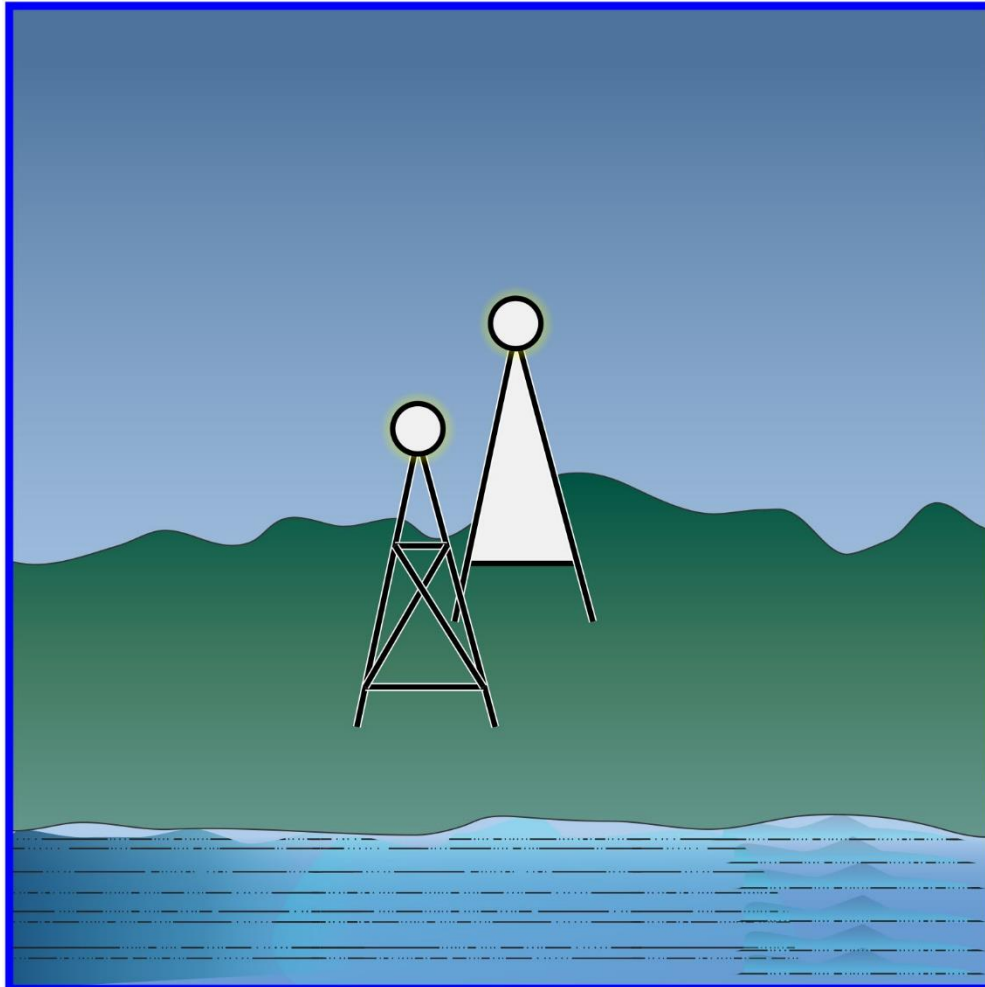
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