

## U.S.C.G. Merchant Marine Exam

Mate Less than 500-1600 Gross Registered Tons

Q138 Navigation General – Near Coastal

(Sample Examination)

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

1. Which is TRUE for the directive force acting on a gyrocompass?
- A. The force increases as the latitude increases, being maximum at the geographic poles
  - B. The force increases as the latitude decreases, being maximum at the geographic equator
  - 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: B

2. Which weather element cannot be measured accurately while on board a moving vessel?
- A. Temperature
  - B. Atmospheric pressure
  - C. Visibility
  - D. Wind direction

Correct answer: C

3. Which position includes the effects of wind and current?
- A. Set position
  - B. Estimated position
  - C. Leeway position
  - D. Dead reckoning position

Correct answer: B

4. Which term is used to describe the time interval between successive wave crests?
- A. Frequency
  - B. Trough
  - C. Period
  - D. Epoch

Correct answer: C

5. What is the characteristic of a quick flashing light?
- A. Shows quick flashes for about 5 seconds followed by a 1 second dark period
  - B. Shows groups of 2 or more flashes at regular intervals
  - C. Shows not less than 60 flashes per minute
  - D. Durations of light and darkness are equal

Correct answer: C

6. Where are buoys and day beacons exhibiting a yellow triangle or square painted on them used?
- A. Locations where the ICW and other waterways coincide
  - B. Only at particularly hazardous turns of the channel
  - C. On isolated stretches of the ICW to mark undredged areas
  - D. In minor harbors where the controlling depth is 10 feet (3 meters) or less

Correct answer: A

7. Which is TRUE of echo-sounders?

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

Correct answer: B

8. In the Northern hemisphere which semicircle of a hurricane is the navigable semicircle?

- A. Front
- B. Right
- C. Back
- D. Left

Correct answer: D

9. What does a Doppler log in the bottom return mode indicate?

- A. The speed over the ground
- B. The depth of the water
- C. The bottom characteristics
- D. The velocity of the current

Correct answer: A

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

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

Correct answer: A

11. What does a barometer showing falling pressure indicate?

- A. A low dew point
- B. The approach of a high-pressure system
- C. A high dew point
- D. The approach of a low-pressure system

Correct answer: D

12. The hurricane season in the North Atlantic Ocean reaches its peak during which month?

- A. July
- B. June
- C. September
- D. November

Correct answer: C

**13.** How are chart legends which indicate a conspicuous landmark printed?

- A. With underlined letters
- B. In capital letters
- C. In italics
- D. In boldfaced print

Correct answer: B

**14.** You are steaming southward along the west coast of the United States when you encounter a buoy showing a flashing red light. Which is TRUE concerning the buoy?

- A. The buoy can remain on either side close aboard
- B. The buoy should be left on the vessel's starboard side
- C. The buoy can be on either side well clear
- D. The buoy should be left on the vessel's port side

Correct answer: D

**15.** Which defines the term relative humidity?

- A. The ratio of the actual vapor content at the current temperature to the air's vapor holding capability
- B. The maximum vapor content the air is capable of holding
- C. The relation of the moisture content of the air to barometric pressure
- D. The maximum vapor content the air is capable of holding at 70 degrees

Correct answer: A

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

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

Correct answer: D

**17.** You take a bearing of 356° of a lighthouse. What bearing of another object would give the best fix?

- A. 082°
- B. 176°
- C. 013°
- D. 201°

Correct answer: A

**18.** Fog is formed when which condition exists?

- A. When air is cooled to its dew point
- B. The clouds are middle altitude
- C. When there is moisture in the air
- D. When the land is cooled to its dew point

Correct answer: A

**19.** Under the IALA-B Buoyage System, when entering from seaward which lateral system buoy as shown in illustration D046NG below, should be left to port?

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

Correct answer: D

**20.** What is published by the U.S. Coast Guard?

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

Correct answer: D

**21.** You sight a buoy fitted with a double-sphere topmark. If sighted at night, what color and light sequence would you expect to see?

- A. A quick-flashing red light
- B. A quick-flashing green light
- C. A flashing red light showing a group of three flashes
- D. A flashing white light showing a group of two flashes

Correct answer: D

**22.** Your vessel is proceeding up a channel steering on a pair of range lights that are in line ahead. The chart indicates that the direction of this pair of lights is  $249^{\circ}T$ , and the variation is  $14^{\circ}E$ . If the heading of your vessel at the time of the sighting is  $226^{\circ}$  per standard magnetic compass, what is the correct deviation?

- A.  $5^{\circ}E$
- B.  $5^{\circ}W$
- C.  $9^{\circ}E$
- D.  $9^{\circ}W$

Correct answer: C

**23.** While on a course of  $019^{\circ}pgc$ , a light bears  $14^{\circ}$  on the port bow at a distance of 15.3 miles. What course should you steer to pass 1.5 miles abeam of the light, leaving it to port?

- A.  $015^{\circ}pgc$
- B.  $011^{\circ}pgc$
- C.  $013^{\circ}pgc$
- D.  $006^{\circ}pgc$

Correct answer: B

**24.** Which statement(s) is/are TRUE concerning radio equipment on towing vessels of 26 feet or more in length?

- A. Each radio operator must hold an FCC-issued restricted operator's license, or higher.
- B. Maintain a continuous listening watch on VHF channel 16 and the bridge-to-bridge channel.
- C. The vessel must have a ship-radio-station license issued by the FCC.
- D. All of the above.

Correct answer: D

**25.** Which of the symbols shown in illustration D018NG below represents a warm front?

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

Correct answer: C

**26.** 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

**27.** Which list of clouds is in sequence, from highest to lowest in the sky?

- A. Stratus, cirrostratus, altostratus
- B. Altostratus, cirrostratus, stratus
- C. Cirrostratus, altostratus, stratus
- D. Altostratus, stratus, cirrostratus

Correct answer: C

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

Correct answer: D

- 29.** When does a current perpendicular to a vessel's track have the greatest effect on the vessel's course made good?
- A. In shallow water
  - B. At high vessel speeds
  - C. In deep water
  - D. At low vessel speeds

Correct answer: D

- 30.** You are in a buoyed channel at night and pass a lighted buoy with an irregular characteristic. Who should you report this to?
- A. The harbor master
  - B. The Coast Guard
  - C. The Corps of Engineers
  - D. The National Ocean Service

Correct answer: B

- 31.** Which term is given to a radar display which is oriented, so that north is always at the top of the screen?
- A. Relative display
  - B. Stabilized display
  - C. Composite display
  - D. Unstabilized display

Correct answer: B

- 32.** Which is TRUE concerning Hot air?
- A. Hot air retains the same amount of moisture as cold air
  - B. Hot air holds more moisture than cold air
  - C. Hot air holds less moisture than cold air
  - D. The moisture content of air is independent of air temperature

Correct answer: B

- 33.** What causes variation in a compass?
- A. Worn gears in the compass housing
  - B. Magnetism from the earth's magnetic field
  - C. Lack of oil in the compass bearings
  - D. Magnetism within the vessel

Correct answer: B

- 34.** While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships foghorn 5.5 seconds after the signal was sounded. What is the distance to the shore?
- A. 3450 ft (1052 meters)
  - B. 3825 ft (1166 meters)
  - C. 2475 ft (754 meters)
  - D. 3072 ft (936 meters)

Correct answer: D

- 35.** 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. 003°
  - C. 363°
  - D. 177°

Correct answer: D

- 36.** The world is divided into NAVAREAS for the dissemination of important marine information. Which NAVAREAS include the U.S. coasts?
- A. I and II
  - B. IV and XII
  - C. V and X
  - D. VI and VII

Correct answer: B

- 37.** You are radar scanning for a buoy fitted with a racon. In illustration D017NG below, which radar screen represents the presentation you should expect on the PPI?
- A. A
  - B. B
  - C. C
  - D. D

Correct answer: B

- 38.** Which defines a light's luminous range?
- A. The maximum distance at which a light may be seen considering the height of the light and the height of the observer
  - B. The maximum distance at which a light may be seen in clear weather
  - C. The average distance of visibility of the light
  - D. The maximum distance at which a light may be seen under existing visibility conditions

Correct answer: D

- 39.** To measure distance on a Mercator chart between the parallels of LAT 34°30'N and LAT 31°30'N, which 30-mile scale should be used?
- A. 33°00'N to 33°30'N
  - B. 32°15'N to 32°45'N
  - C. 32°30'N to 33°00'N
  - D. 32°45'N to 33°15'N

Correct answer: D

- 40.** Which type of precipitation is a product of the violent convection in thunderstorms?
- A. Hail
  - B. Snow
  - C. Sleet
  - D. Freezing Rain

Correct answer: A

- 41.** 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. reduce speed only where local speed limits are posted
  - C. enter all required test and inspection results in the vessel's log or other record carried on board
  - D. evaluate the danger of each closing visual or radar contact

Correct answer: B

- 42.** What wind reverses directions seasonally?
- A. Jet stream
  - B. Hooked trades
  - C. Monsoon winds
  - D. Secondary winds

Correct answer: C

- 43.** The needle of an aneroid barometer points to 30.05 on the dial. What does this indicate?
- A. 30.05 millibars
  - B. 30.05 millimeters of mercury
  - C. The barometric pressure is falling
  - D. 30.05 inches of mercury

Correct answer: D

- 44.** You are underway on course 120°T and your maximum speed is 12 knots. The eye of a hurricane bears 150°T, 120 miles from your position. The hurricane is moving towards 295°T at 20 knots. If you maneuver at 12 knots to avoid the hurricane, what could be the maximum CPA?
- A. 89 miles
  - B. 96 miles
  - C. 105 miles
  - D. 117 miles

Correct answer: D

- 45.** Which term is given to the mechanical lifting of air by the upslope slant of the terrain?
- A. Convective lifting
  - B. Advective lifting
  - C. Topographic lifting
  - D. Vertical lifting

Correct answer: C

- 46.** What is NOT a characteristic of cardinal marks?
- A. White lights
  - B. Yellow and black bands
  - C. Square or triangular topmarks
  - D. Directional orientation to a hazard

Correct answer: C

- 47.** The Light List indicates that a light has a nominal range of 18 miles and is 38 feet high. If the visibility is 6 miles and your height of eye is 15 feet, at which distance will you sight the light?
- A. 14.8nm
  - B. 18.0nm
  - C. 6.0nm
  - D. 11.7nm

Correct answer: D

- 48.** You are in a channel inbound from sea. A daymark used to mark a channel junction when the preferred channel is to starboard will have the shape indicated by what letter in illustration D045NG below?
- A. A
  - B. B
  - C. C
  - D. D

Correct answer: A

**49.** What causes compass deviation?

- A. Magnetism from the earth's magnetic field
- B. Magnetism within the vessel
- C. A dirty compass housing
- D. Misalignment of the compass

Correct answer: B

**50.** A vessel's position should be plotted using bearings of \_\_\_\_\_.

- A. fixed known objects on shore
- B. buoys close at hand
- C. fixed objects
- D. All of the above

Correct answer: A

**51.** To avoid error, how should you read the scale of an aneroid barometer?

- A. With your eye slightly above the meniscus
- B. With your eye to the right of the pointer
- C. With your eye to the left of the pointer
- D. With your eye directly in front of the pointer

Correct answer: D

**52.** Which item in illustration D034NG below shows an occulting light?

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

Correct answer: B

**53.** The vertical distance from the tidal datum to the level of the water is the \_\_\_\_\_.

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

Correct answer: D

**54.** 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 8 hours
- B. Every hour
- C. Every 3 hours
- D. Every 6 hours

Correct answer: C

**55.** What type of clouds are associated with a cold front?

- A. Altostratus and cirrus
- B. Altostratus and fracto-cumulus
- C. Cirrus and cirrostratus
- D. Cumulus and cumulonimbus

Correct answer: D

**56.** What is the reaction of a gyrocompass to an applied force known as?

- A. Earth rate
- B. Precession
- C. Gyroscopic inertia
- D. Gravity effect

Correct answer: B

**57.** 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

**58.** When do Spring tides occur?

- A. When the Sun and Moon are in quadrature
- B. When the Moon's declination is maximum and opposite to that of the Sun
- C. When the Moon is new or full
- D. When the Moon is in its first quarter or third quarter phase

Correct answer: C

**59.** Which of the following is associated with consistently high barometric pressure?

- A. The horse latitudes
- B. The doldrums
- C. The trade winds
- D. The prevailing westerlies

Correct answer: A

**60.** Your ship is proceeding on course  $320^{\circ}T$  at a speed of 25 knots. The apparent wind is from  $30^{\circ}$  off the starboard bow, speed 32 knots. What is the relative direction, true direction and speed of the true wind?

- A. Relative  $60^{\circ}$ , true  $040^{\circ}T$ , 18.6 knots
- B. Relative  $40^{\circ}$ , true  $080^{\circ}T$ , 16.4 knots
- C. Relative  $80^{\circ}$ , true  $060^{\circ}T$ , 15.2 knots
- D. Relative  $80^{\circ}$ , true  $040^{\circ}T$ , 16.2 knots

Correct answer: D

- 61.** According to Buys Ballot's Law, when an observer in the Southern Hemisphere experiences a northwest wind, where is the center of the low pressure located?
- A. South-Southwest
  - B. East-Northeast
  - C. East-Southeast
  - D. West-Southwest

Correct answer: A

- 62.** The shoreline shown on nautical charts of areas affected by large tidal fluctuations is usually the line of mean \_\_\_\_\_.
- A. high water
  - B. lower low water
  - C. tide level
  - D. low water

Correct answer: A

- 63.** When making landfall at night, how can you determine if a light is a major light or an offshore buoy?
- A. By the color, because the buoy will have only a red or a green light
  - B. By checking the period and characteristics against the Light List
  - C. By observing the intensity of the light
  - D. All of the above can be used to identify the light.

Correct answer: B

- 64.** Your vessel is participating in the Voluntary Observing Ship Program, you are preparing WS Form B-80 as seen in illustration D041NG below. The sky is overcast, and the anemometer indicates that the apparent wind is from  $144^{\circ}$  relative at 8 knots. You are on course  $162^{\circ}$ T at 15 knots. How should you encode group Nddff?
- A. 81408
  - B. 01615
  - C. 83322
  - D. 91521

Correct answer: C

- 65.** Your vessel is leaving New York harbor in dense fog. As the vessel slowly proceeds toward sea, you sight a green can buoy on the starboard bow. Which action should you take?
- A. Pass the buoy close to, leaving it to your port.
  - B. Stop and fix your position.
  - C. Turn hard right to get back into the channel.
  - D. Stand on, leaving the buoy to your starboard.

Correct answer: D

**66.** Which is TRUE of mean high water?

- A. It is used as the reference plane for bottom contour lines
- B. It is used to indicate the shoreline where there is a large tidal fluctuation
- C. It is used as the sounding datum for rivers, lakes, etc. regulated by locks
- D. It is used as the reference for soundings on the Gulf coast of the U.S.

Correct answer: B

**67.** What is the standard atmospheric pressure in millibars?

- A. 760.0
- B. 938.9
- C. 1000.0
- D. 1013.2

Correct answer: D

**68.** What is indicated when slanted letters are used to spell the name of a charted object?

- A. The object is always visible
- B. The object is a hazard to vessels drawing 20 feet draft
- C. The position is approximate or doubtful
- D. The object is underwater or floating

Correct answer: D

**69.** Your vessel is entering port and you have steadied up on a range, dead ahead, in line with your keel. After a few minutes the range, still dead ahead, appears as shown in illustration D047NG below. Which action should you take?

- A. Increase speed
- B. Alter heading to the left
- C. Alter heading to the right
- D. Maintain heading, keeping the range dead ahead

Correct answer: B

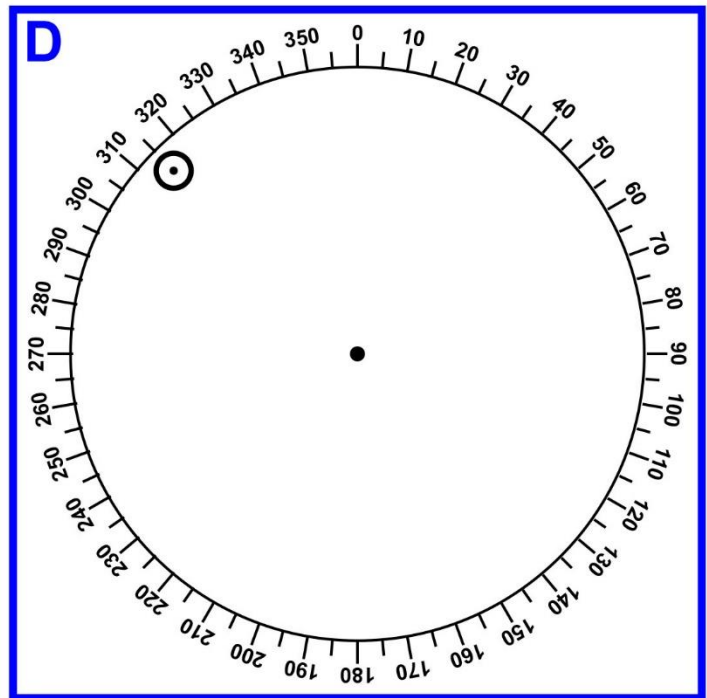
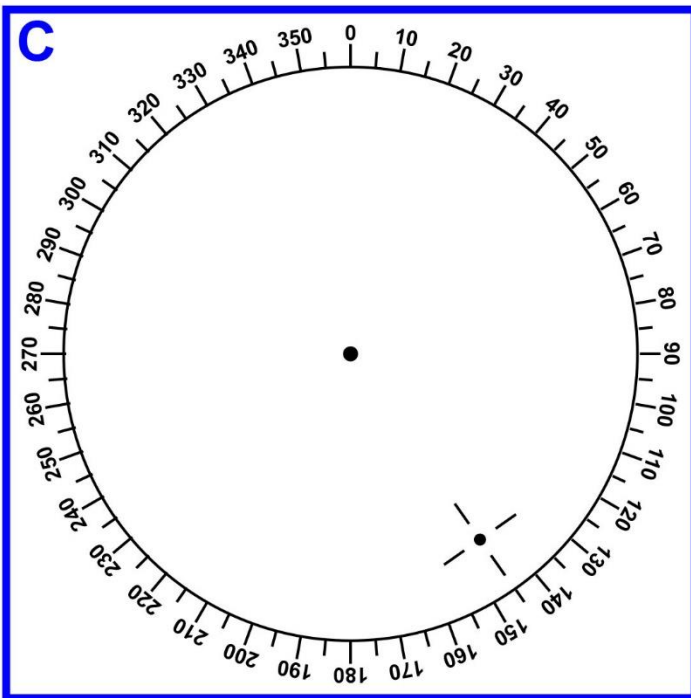
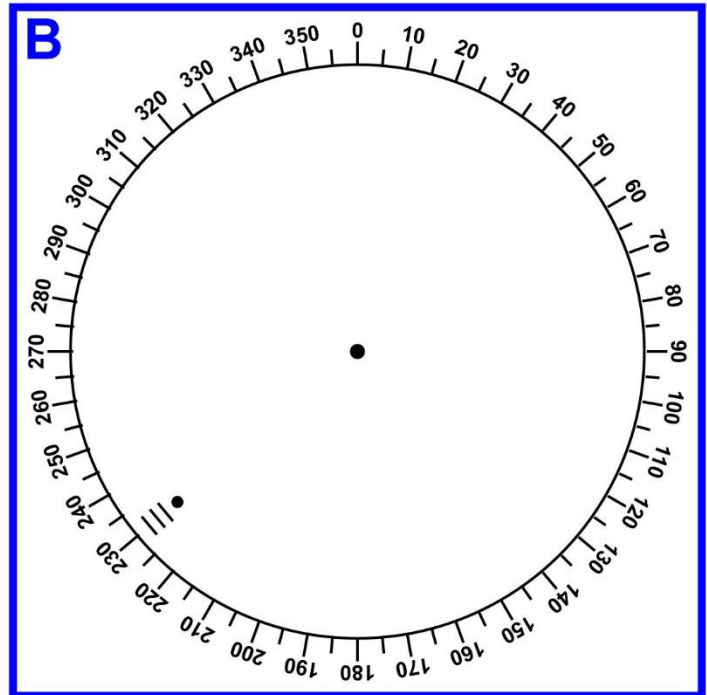
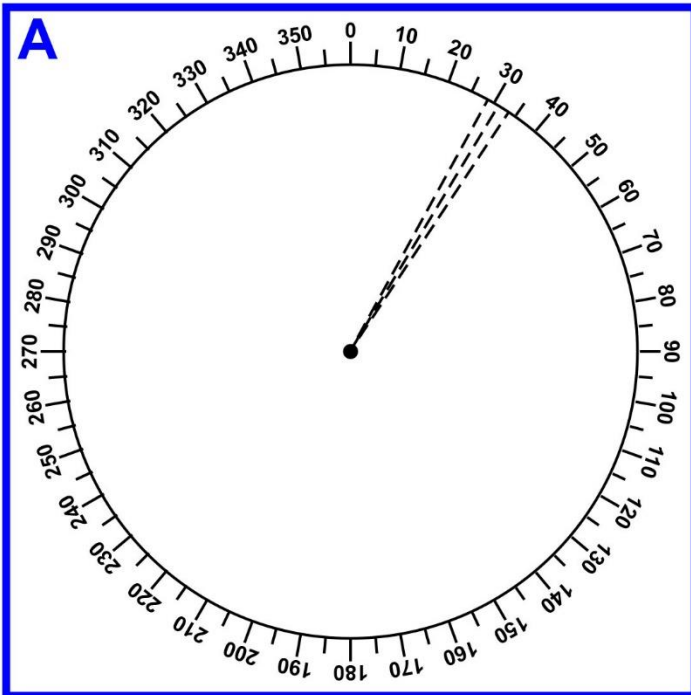
**70.** You are taking bearings on two known objects ashore. The BEST fix is obtained when the angle between the lines of position is \_\_\_\_\_.

- A. 45°
- B. 60°
- C. 90°
- D. 30°

**Correct answer: C**



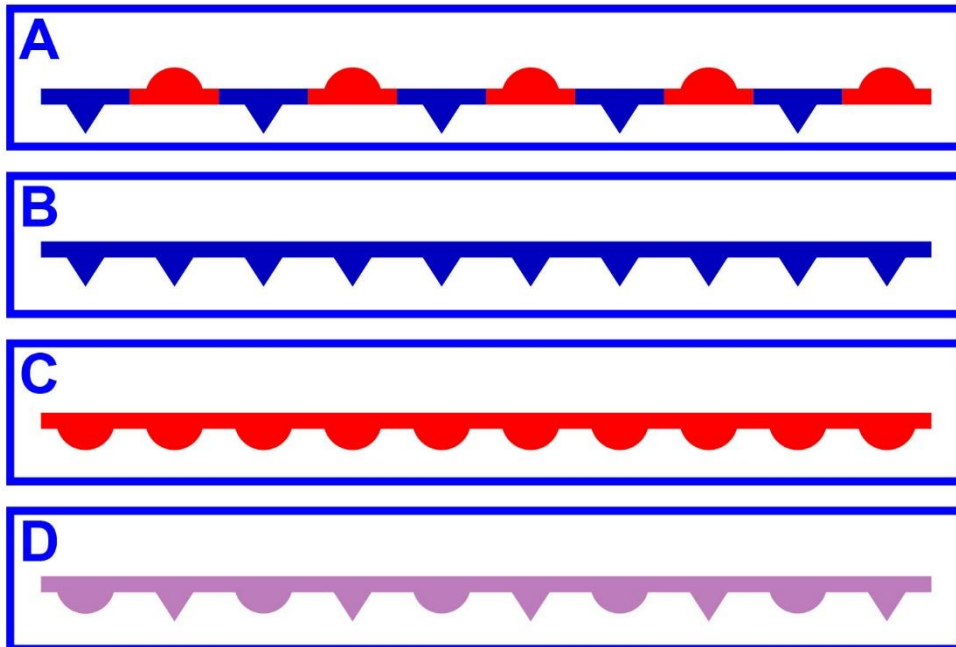
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# United States Coast Guard National Maritime Center



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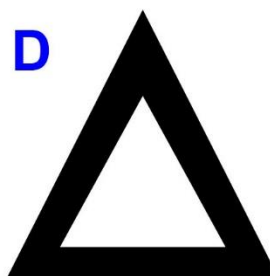
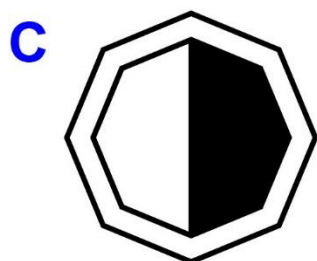
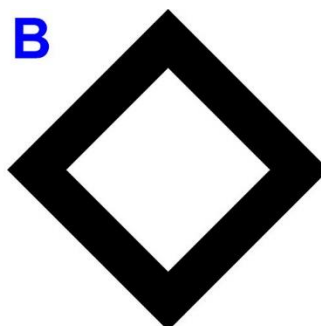
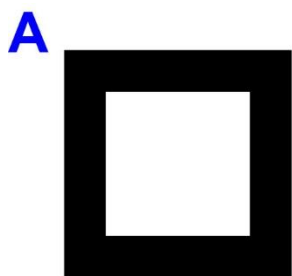
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<b>WEATHER REPORT FOR IMMEDIATE TRANSMISSION</b>						
NO.	SHIP NAME	DATE SENT (UTC)	TIME SENT (UTC)	STA. CALLED	FREQUENCY	
<b>ADDRESSES</b>						
U.S. Coast Guard: No address needed, start with BBXX indicator and ship's call sign.						
<b>INMARSAT</b> Standard A: Select—Coast Earth Station (CES), routine priority, duplex telex channel, and initiate call. When GA + is received, select 41 +. Upon receipt of answerback, NWS OBS MHTS, send the weather report starting with the BBXX indicator and ship's call sign. End the report with 5 periods. Try to limit INMARSAT call time to 30 seconds. Standard C: To establish special access code 41, see manufacturers recommended instructions for set-up, or the Mariners Weather Log Summer, 1994, or later editions.						
U.S. commercial and foreign radio stations: To: OBS METEO _____ (get address from "Radio Stations Accepting. . . ."). Start with BBXX indicator and ship's call sign and combine the remaining numbers into 10-character groups.						
INDICATOR	CALL SIGN	YYGG <sub>i</sub> w	99L <sub>a</sub> L <sub>a</sub> L <sub>a</sub>	Q <sub>c</sub> L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> L <sub>o</sub>	i <sub>R</sub> i <sub>x</sub> hVV	Nddff
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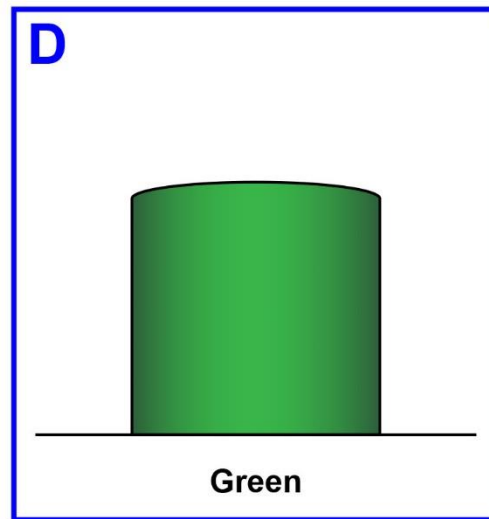
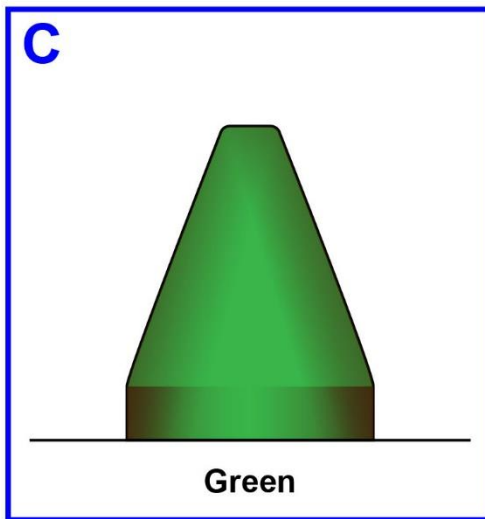
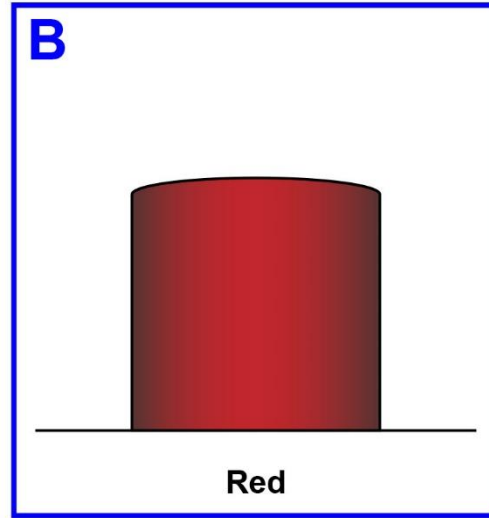
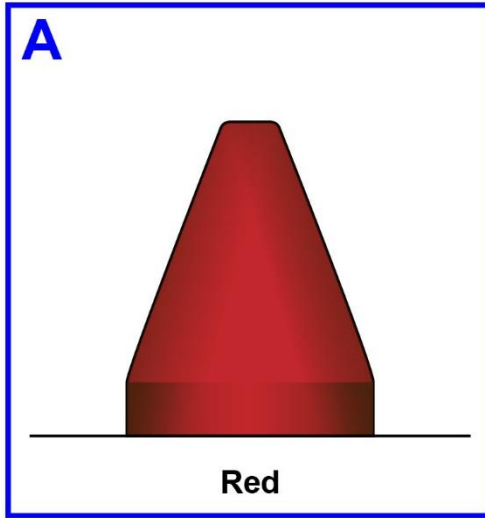


**D045NG**



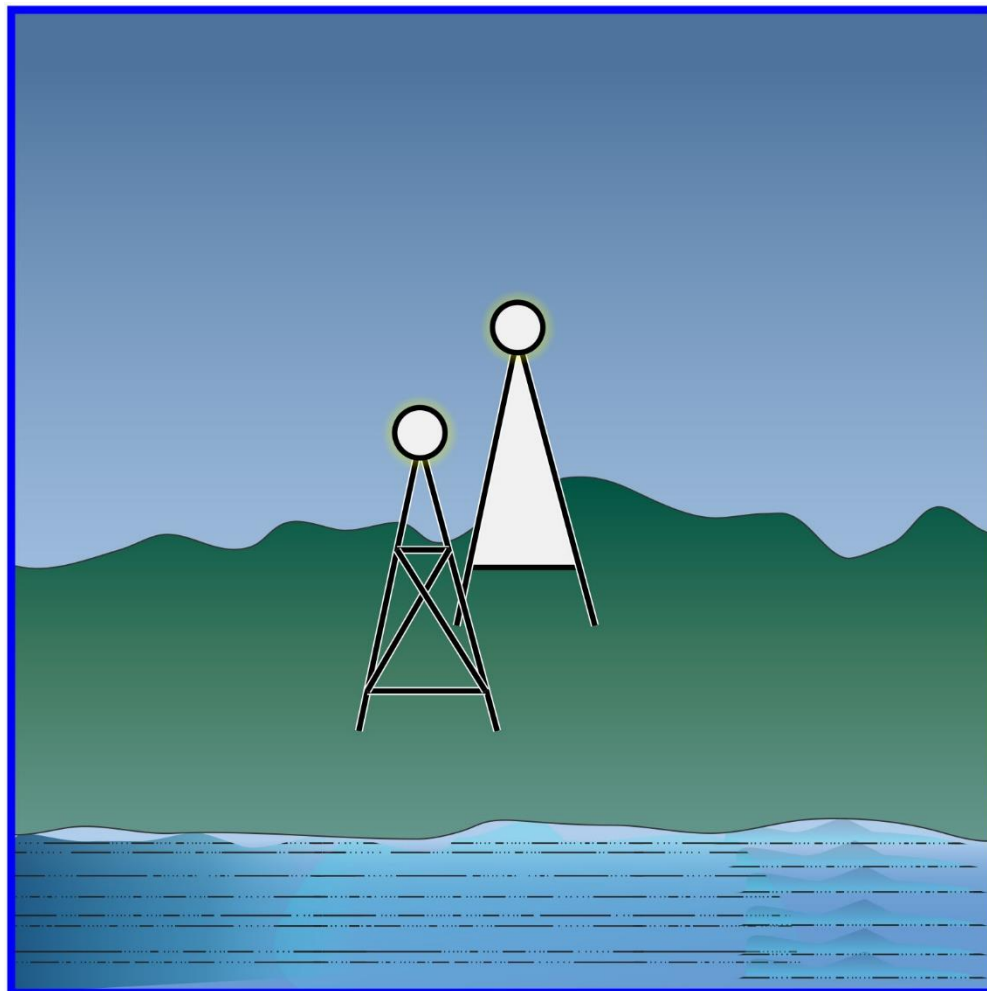


**D046NG**





**D047NG**



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An Epitome of Navigation, 2002 Bicentennial Edition  
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