

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 type of weather could you expect soon after seeing "hook" or "comma" shaped cirrus clouds?

- (A) Rain with the approach of a warm front
- (B) Continuing fog and rain
- (C) Clearing with the approach of a cold front
- (D) The formation of a tropical depression

*If choice A is selected set score to 1.*

**2.** Your vessel is participating in the Voluntary Observing Ship Program. You are preparing WS Form B-80 as seen in illustration D041NG below. Three-quarters of the sky is covered with clouds, and the anemometer indicates that the apparent wind is from 226° relative at 17.7 knots. You are on course 020°T at 8 knots. How should you encode group Nddff?

- (A) 72218
- (B) 72318
- (C) 80208
- (D) 62324

*If choice D is selected set score to 1.*

**3.** The greater the pressure difference between a high and a low pressure center, the \_\_\_\_\_.

- (A) dryer the air mass will be
- (B) cooler the temperature will be
- (C) greater the force of the wind will be
- (D) warmer the temperature will be

*If choice C is selected set score to 1.*

**4.** The Light List indicates that a dayboard is a type TR-SY. Which action should you take?

- (A) Look for a dayboard of type TR-TY to form a range
- (B) Expect a daymark with no lateral significance
- (C) Leave it to port when southbound on the Atlantic portions of the ICW
- (D) Pass it close aboard on either side

*If choice C is selected set score to 1.*

**5.** What do red sectors of navigation lights warn mariners of?

- (A) Recently sunken vessels
- (B) Heavily trafficked areas
- (C) Shoals or nearby land
- (D) Floating debris

*If choice C is selected set score to 1.*

**6.** Information markers, when lighted, will display which color light?

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

*If choice D is selected set score to 1.*

**7.** Which is TRUE concerning the flow of air around an anticyclone in the Southern Hemisphere?

- ☐ (A) Air flows in a clockwise and outward direction
- ☐ (B) Air flows in a clockwise and inward direction
- ☐ (C) Air flows in a counterclockwise and inward direction
- ☒ (D) Air flows in a counterclockwise and outward direction

*If choice D is selected set score to 1.*

**8.** You are underway on course 050°T and your maximum speed is 10 knots. The eye of a hurricane bears 100°T, 90 miles from your position. The hurricane is moving towards 285°T at 19 knots. If you maneuver at 10 knots to avoid the hurricane, what could be the maximum CPA?

- ☐ (A) 39 miles
- ☐ (B) 45 miles
- ☒ (C) 53 miles
- ☐ (D) 59 miles

*If choice C is selected set score to 1.*

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

- ☐ (A) A
- ☐ (B) B
- ☒ (C) C
- ☐ (D) D

*If choice C is selected set score to 1.*

**10.** The dry bulb temperature is 58° F (14.4° C) and the wet bulb temperature is 44° F (6.7° C). What is the relative humidity?

- ☐ (A) 25%
- ☒ (B) 28%
- ☐ (C) 30%
- ☐ (D) 58%

*If choice B is selected set score to 1.*

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

- (A) Peru
- (B) Morocco
- (C) Saudi Arabia
- (D) Poland

*If choice A is selected set score to 1.*

**12.** The velocity of the apparent wind can be more than the true wind, and come from the same direction, if certain conditions are present. One condition is that the \_\_\_\_\_.

- (A) true wind must be from dead astern
- (B) ship's speed must be less than the true wind velocity
- (C) true wind velocity must be faster than the ship's speed
- (D) true wind must be from dead ahead

*If choice D is selected set score to 1.*

**13.** 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 serves no significant purpose
- (C) It is used to identify the characteristics of the light
- (D) It indicates a danger area

*If choice D is selected set score to 1.*

**14.** In modern fathometers, what produces the sonic or ultrasonic sound waves?

- (A) An amplifier
- (B) A transducer
- (C) A generator
- (D) A transceiver

*If choice B is selected set score to 1.*

**15.** You have determined that you are in the right semicircle of a tropical cyclone in the Northern Hemisphere. What action should you take to avoid the storm?

- (A) Place the wind on the starboard bow and hold that course.
- (B) Place the wind on the starboard quarter and hold that course.
- (C) Place the wind on the port quarter and hold that course.
- (D) Place the wind on the port bow and hold that course.

*If choice A is selected set score to 1.*

**16.** When a dual purpose marking is used, how should the mariner following the Intracoastal Waterway be guided?

- (A) By the color of the top band
- (B) By the shape of the yellow mark
- (C) By the shape of the aid
- (D) By the color of the aid

*If choice B is selected set score to 1.*

**17.** Which best defines the height of tide?

- (A) The difference between the depth of the water at high tide and the depth of the water at low tide
- (B) The difference between the depth of the water and the area's tidal datum
- (C) The difference between the depth of the water and the high water tidal level
- (D) The depth of water at a specific time due to tidal effect

*If choice B is selected set score to 1.*

**18.** What is a "Special Warning"?

- (A) An urgent message concerning a vessel in distress
- (B) A weather advisory about unusual meteorological or oceanographic phenomena hazardous to vessels
- (C) A radio navigational warning concerning a particularly hazardous condition affecting navigation
- (D) A broadcast disseminating an official government proclamation affecting shipping

*If choice D is selected set score to 1.*

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

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

*If choice D is selected set score to 1.*

**20.** The owner or Master of a towing vessel that is operating within a Vessel Traffic Service (VTS) area must report specific information to the service. Which of the following choices is not required to be reported?

- ☐ (A) Any malfunction of propulsion machinery, steering gear, radar, gyrocompass or depth-sounder, if installed
- ☒ (B) The type of credential he/she holds and its serial number
- ☐ (C) A shortage of personnel, lack of charts, maps or other required publications
- ☐ (D) Any characteristics of the vessel that affect its maneuverability

*If choice B is selected set score to 1.*

**21.** Mean lower low water is the reference plane used for which measurements?

- ☐ (A) The heights above water for lights, mountains, etc.
- ☐ (B) The water depths on the U.S. east coast only
- ☐ (C) All vertical measurements
- ☒ (D) The soundings on the U.S. east and west coasts

*If choice D is selected set score to 1.*

**22.** What kind of pressure systems travel in tropical waves?

- ☐ (A) Terrastatic pressure
- ☒ (B) Low pressure
- ☐ (C) Subsurface pressure
- ☐ (D) High pressure

*If choice B is selected set score to 1.*

**23.** 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.*

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

- ☒ (A) In capital letters
- ☐ (B) In italics
- ☐ (C) With underlined letters
- ☐ (D) In boldfaced print

*If choice A is selected set score to 1.*

**25.** On which of the following does an automatic identification system (AIS) transponder transmit and receive information?

- ☐ (A) UHF L-band
- ☐ (B) 3 cm, X-band radar
- ☐ (C) 10 cm, S-band radar
- ☒ (D) VHF maritime band

*If choice D is selected set score to 1.*

**26.** The four standard light colors used for lighted aids to navigation are red, green, white, and \_\_\_\_\_.

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

*If choice C is selected set score to 1.*

**27.** Which instrument is designed to maintain a continuous record of atmospheric pressure?

- ☐ (A) A thermograph
- ☐ (B) An aneroid barometer
- ☒ (C) A barograph
- ☐ (D) A mercurial barometer

*If choice C is selected set score to 1.*

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

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

*If choice A is selected set score to 1.*

**29.** The shoreline shown on nautical charts of areas affected by large tidal fluctuations is usually the line of mean \_\_\_\_\_.

- ☐ (A) low water
- ☒ (B) high water
- ☐ (C) lower low water
- ☐ (D) tide level

*If choice B is selected set score to 1.*

**30.** Which information is NOT required to be posted in or near the wheelhouse?

- ☐ (A) Stopping time and distance from full speed while maintaining course with minimum rudder
- ☒ (B) A diagram of advance and transfer for turns of 30°, 60°, 90° and 120° at full speed with maximum rudder and constant power
- ☐ (C) Operating instructions for change-over procedures for remote steering gear systems
- ☐ (D) For vessels with a fixed propeller, a table of shaft RPMs for a representative range of speeds

*If choice B is selected set score to 1.*

**31.** The light rhythm of Morse (A) is shown on which buoy(s)

- ☐ (A) Preferred channel buoys
- ☒ (B) Safe water buoys
- ☐ (C) Starboard or port side buoys
- ☐ (D) Special marks

*If choice B is selected set score to 1.*

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

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

*If choice D is selected set score to 1.*

**33.** The needle of an aneroid barometer points to 30.05 on the dial. What does this indicate?

- ☒ (A) 30.05 inches of mercury
- ☐ (B) 30.05 millibars
- ☐ (C) 30.05 millimeters of mercury
- ☐ (D) The barometric pressure is falling

*If choice A is selected set score to 1.*

**34.** The climate of the eastern coast of the Gulf of Mexico \_\_\_\_\_.

- ☐ (A) has an east coast marine type of climate
- ☐ (B) has a Mediterranean type of climate
- ☒ (C) varies from warm to subtropical
- ☐ (D) is humid and subtropical throughout the year

*If choice C is selected set score to 1.*



**35.** Your vessel is on a course of  $207^{\circ}\text{T}$  at 13 knots.

At 0539 a light bears  $180.5^{\circ}\text{T}$ , and at 0620 the light bears  $162^{\circ}\text{T}$ .

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

- (A) 0701, 8.9 miles
- (B) 0641, 6.5 miles
- (C) 0633, 5.9 miles
- (D) 0653, 7.6 miles

*If choice A is selected set score to 1.*

**36.** You are outbound in a channel marked by a range astern. The range line is  $133^{\circ}\text{T}$ . You are steering  $315^{\circ}\text{T}$  and have the range in sight as shown in illustration D048NG below. What action should you take?

- (A) Come left to  $313^{\circ}\text{T}$ .
- (B) Come left to close the range then when on the range steer  $313^{\circ}\text{T}$ .
- (C) Come right until the range comes in line then alter course to  $313^{\circ}\text{T}$ .
- (D) Come right until the range comes in line then alter course to  $317^{\circ}\text{T}$ .

*If choice B is selected set score to 1.*

**37.** What must change for the compass deviation to change?

- (A) The heading of the vessel
- (B) The speed of the vessel
- (C) The geographical position of the vessel
- (D) The longitude of the vessel

*If choice A is selected set score to 1.*

**38.** You wish to measure the distance on a Mercator chart between a point in latitude  $42^{\circ}30'\text{N}$  and a point in latitude  $40^{\circ}30'\text{N}$ . To measure 30 miles at a time where should you set the points of the dividers to obtain the most accuracy?

- (A)  $41^{\circ}15'$  and  $41^{\circ}45'$
- (B)  $41^{\circ}45'$  and  $42^{\circ}15'$
- (C)  $42^{\circ}15'$  and  $42^{\circ}45'$
- (D)  $42^{\circ}00'$  and  $42^{\circ}30'$

*If choice A is selected set score to 1.*

**39.** The buoy symbol printed on your chart is leaning to the northeast. What does this indicate?

- ☐ (A) You should stay to the west or south of the buoy
- ☒ (B) Nothing special for navigational purposes
- ☐ (C) The buoy is a major lighted buoy
- ☐ (D) You should stay to the north or east of the buoy

*If choice B is selected set score to 1.*

**40.** 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.*

**41.** Which are the two most effective generating forces of surface ocean currents?

- ☐ (A) Temperature and salinity differences in the water
- ☒ (B) Wind and density differences in the water
- ☐ (C) Rotation of the Earth and continental interference
- ☐ (D) Water depth and underwater topography

*If choice B is selected set score to 1.*

**42.** What causes compass deviation?

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

*If choice A is selected set score to 1.*

**43.** Which correction(s) must be applied to an aneroid barometer?

- ☐ (A) Instrument error only
- ☐ (B) Instrument error and latitude correction
- ☐ (C) Height error only
- ☒ (D) Instrument error and height error

*If choice D is selected set score to 1.*

**44.** 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 3 hours
- ☐ (C) Every hour
- ☐ (D) Every 6 hours

*If choice B is selected set score to 1.*

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

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

*If choice C is selected set score to 1.*

**46.** What is the approximate wave length of an X Band Radar operating on a frequency of approximately 9.5 GHz?

- ☒ (A) 3 cm
- ☐ (B) 10 cm
- ☐ (C) 30 cm
- ☐ (D) 100 cm

*If choice A is selected set score to 1.*

**47.** The apparent wind's speed can be zero, but only when two conditions are present. One condition is that the true \_\_\_\_\_.

- ☐ (A) wind must be from dead ahead
- ☒ (B) wind's speed equals the ship's speed
- ☐ (C) wind's speed must be zero
- ☐ (D) wind must be on the beam

*If choice B is selected set score to 1.*

**48.** You take a bearing of 191° and 313° to two objects. Which bearing of a third object will give the best fix?

- ☐ (A) 022°
- ☐ (B) 131°
- ☐ (C) 211°
- ☒ (D) 249°

*If choice D is selected set score to 1.*

**49.** Which is the difference between the DR position and a fix, both of which have the same time?

- (A) Current
- (B) Variation
- (C) Deviation
- (D) Leeway

*If choice A is selected set score to 1.*

**50.** As a high pressure system approaches, which is TRUE concerning the barometer reading?

- (A) The reading falls
- (B) The reading falls rapidly
- (C) The reading stays the same
- (D) The reading rises

*If choice D is selected set score to 1.*

**51.** While proceeding along the Mediterranean coast of Spain, you sight the black and yellow buoy shown in illustration D020NG below. Your course is 039°T, and the buoy bears 053°T. What action should you take?

- (A) Maintain course and ensure that the bearings increase
- (B) Alter course to 053°T and pass the buoy close aboard on either side
- (C) Alter course to 060° and ensure that the bearings decrease
- (D) Alter course towards the buoy and leave the buoy well clear on either side

*If choice A is selected set score to 1.*

**52.** Which statement about gyrocompass error is TRUE?

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

*If choice B is selected set score to 1.*

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

- (A) White caps
- (B) Rollers
- (C) Breakers
- (D) Surfers

*If choice C is selected set score to 1.*

**54.** You are on course  $344^{\circ}\text{T}$  and take a relative bearing of a lighthouse of  $270^{\circ}$ . What is the true bearing to the lighthouse?

- ☐ (A)  $016^{\circ}$
- ☐ (B)  $074^{\circ}$
- ☐ (C)  $090^{\circ}$
- ☒ (D)  $254^{\circ}$

*If choice D is selected set score to 1.*

**55.** 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) 1100 yards
- ☒ (B) 550 yards
- ☐ (C) 792 yards
- ☐ (D) 872 yards

*If choice B is selected set score to 1.*

**56.** The Light List indicates that a light has a nominal range of 14 miles and is 26 feet high. If the visibility is 4 miles and your height of eye is 20 feet, at what approximate distance will you sight the light?

- ☒ (A) 7.5 miles
- ☐ (B) 9.6 miles
- ☐ (C) 11.2 miles
- ☐ (D) 14.0 miles

*If choice A is selected set score to 1.*

**57.** A line of position formed by sighting two charted objects in line is called a(n) \_\_\_\_\_.

- ☒ (A) range line
- ☐ (B) track line
- ☐ (C) estimated position
- ☐ (D) relative bearing

*If choice A is selected set score to 1.*

**58.** When recording the wind direction in the weather log, which information would you report?

- ☐ (A) The duration of the maximum gust of wind
- ☐ (B) The direction the wind is blowing toward
- ☒ (C) The direction the wind is blowing from
- ☐ (D) The wind chill factor

*If choice C is selected set score to 1.*

**59.** Which agency maintains federal aids to navigation?

- (A) Coast Guard
- (B) Corps of Engineers
- (C) Maritime Administration
- (D) National Ocean Service

*If choice A is selected set score to 1.*

**60.** What is a lighted safe water mark fitted with to aid in its identification?

- (A) A red and white octagon
- (B) A sequential number
- (C) A spherical topmark
- (D) Red and white retroreflective material

*If choice C is selected set score to 1.*

**61.** Which is a characteristic of warm air masses?

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

*If choice D is selected set score to 1.*

**62.** What is the name given to lines on a chart which connect points of equal magnetic variation?

- (A) Isogonic lines
- (B) Magnetic declinations
- (C) Magnetic latitudes
- (D) Dip lines

*If choice A is selected set score to 1.*

**63.** A lighthouse is 120 feet (36.6 meters) high and the light has a nominal range of 18 miles. Your height of eye is 42 feet (12.8). If the visibility is 11 miles, approximately how far off the light will you be when the light becomes visible?

- (A) 12.5 miles
- (B) 16.0 miles
- (C) 19.0 miles
- (D) 23.5 miles

*If choice C is selected set score to 1.*

**64.** Which is TRUE of a sea breeze?

- ☐ (A) A wind that blows towards the sea at night
- ☒ (B) A wind that blows towards an island during the day
- ☐ (C) A wind caused by the distant approach of a hurricane
- ☐ (D) A wind caused by cold air descending a coastal incline

*If choice B is selected set score to 1.*

**65.** 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

*If choice D is selected set score to 1.*

**66.** If an observer in the Northern Hemisphere faces the surface wind, where is the center of low pressure located?

- ☒ (A) To the right, and slightly behind
- ☐ (B) To the left, and slightly in front
- ☐ (C) To the left, and slightly behind
- ☐ (D) To the right, and slightly in front

*If choice A is selected set score to 1.*

**67.** A Doppler log in the volume reverberation mode indicates \_\_\_\_\_.

- ☐ (A) the depth of the water
- ☐ (B) the set of the current
- ☒ (C) speed through the water
- ☐ (D) speed being made good

*If choice C is selected set score to 1.*

**68.** You are entering port and have been instructed to anchor, as your berth is not yet available. You are on a SW'ly heading, preparing to drop anchor, when you observe the range lights as shown in illustration D047NG below, on your starboard beam. What action should you take?

- ☐ (A) Drop the anchor immediately as the range lights mark an area free of obstructions
- ☒ (B) Ensure your ship will NOT block the channel or obstruct the range while at anchor
- ☐ (C) NOT drop the anchor until the lights are in line
- ☐ (D) Drop the anchor immediately as a change in the position of the range lights will be an indication of dragging anchor

*If choice B is selected set score to 1.*

**69.** You should plot your dead reckoning position \_\_\_\_\_.

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

*If choice B is selected set score to 1.*

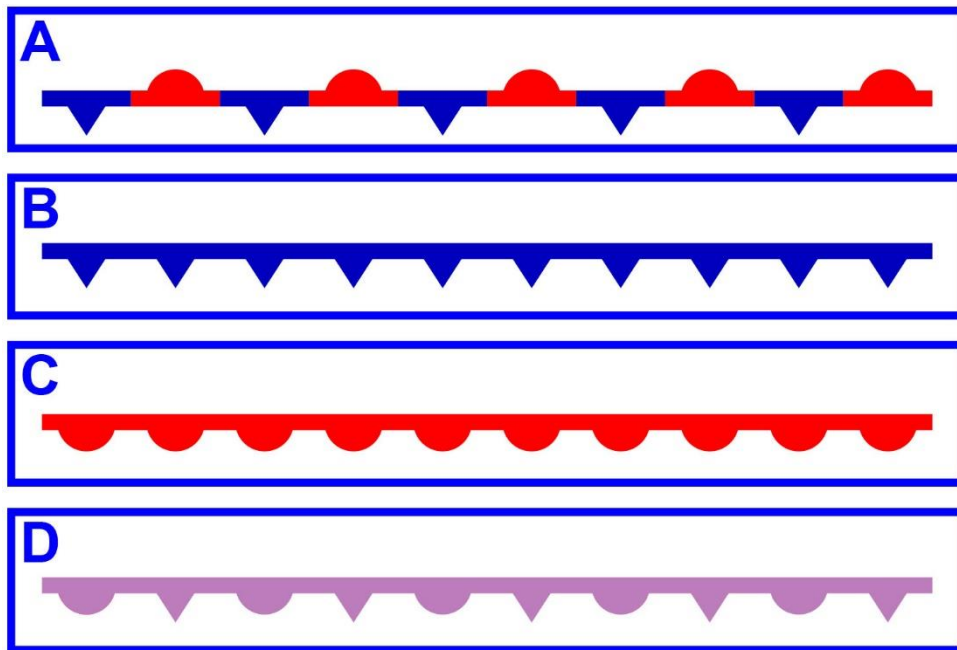
**70.** Your vessel is proceeding up a channel, and you see a pair of range lights that are in line ahead. The chart indicates that the direction of this pair of lights is  $014^{\circ}\text{T}$ , and the variation is  $11^{\circ}\text{E}$ . If the heading of your vessel at the time of the sighting is  $009^{\circ}$  per standard magnetic compass, what is the correct deviation?

- ☐ (A)  $5^{\circ}\text{E}$
- ☐ (B)  $5^{\circ}\text{W}$
- ☐ (C)  $6^{\circ}\text{E}$
- ☒ (D)  $6^{\circ}\text{W}$

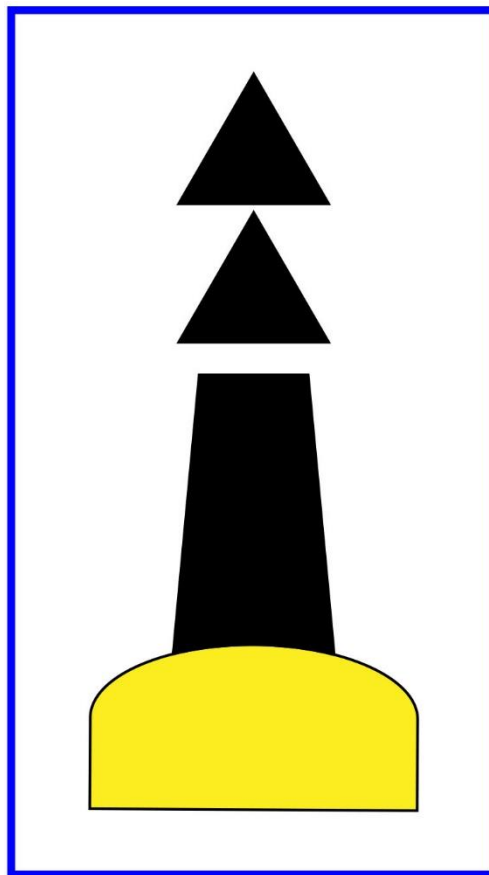
*If choice D is selected set score to 1.*



## D018NG



## D020NG



# National Maritime Center

Keep 'em Safe, Keep 'em Sailing



## D041NG

|  |  |  |  |   |  |
|--|--|--|--|---|--|
| WS FORM B-80 (5-94)<br>PRES. BY WMO DIRECTIVES   |  |  |  | <b>U.S. DEPARTMENT OF COMMERCE</b><br>NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION<br>NATIONAL WEATHER SERVICE |  |
| <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><br>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.<br>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 _____<br>(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  | YYGGi <sub>w</sub>   | 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                                |
| BBXX   |  |  | 99   |   | 4  |
| 00fff  | 1s <sub>n</sub> TTT  | 2s <sub>n</sub> T <sub>d</sub> T <sub>d</sub> T <sub>d</sub>               | 4PPPP  | 5appp   | 7wwW <sub>1</sub> W <sub>2</sub>                                 |
|  |  |  |  |   |  |
| 222D <sub>s</sub> V <sub>s</sub>   | 0s <sub>s</sub> T <sub>w</sub> T <sub>w</sub> T <sub>w</sub> | 2P <sub>w</sub> P <sub>w</sub> H <sub>w</sub> H <sub>w</sub>               | 3d <sub>w1</sub> d <sub>w1</sub> d <sub>w2</sub> d <sub>w2</sub> | 4P <sub>w1</sub> P <sub>w1</sub> H <sub>w1</sub> H <sub>w1</sub>  | 5P <sub>w2</sub> P <sub>w2</sub> H <sub>w2</sub> H <sub>w2</sub> |
|  |  |  |  |   |  |
| 8S <sub>w</sub> T <sub>b</sub> T <sub>b</sub> T <sub>b</sub>   | ICE  | c <sub>i</sub> S <sub>i</sub> b <sub>i</sub> D <sub>i</sub> z <sub>i</sub> | PLAIN LANGUAGE   |   | TRANSMITTED BY   |
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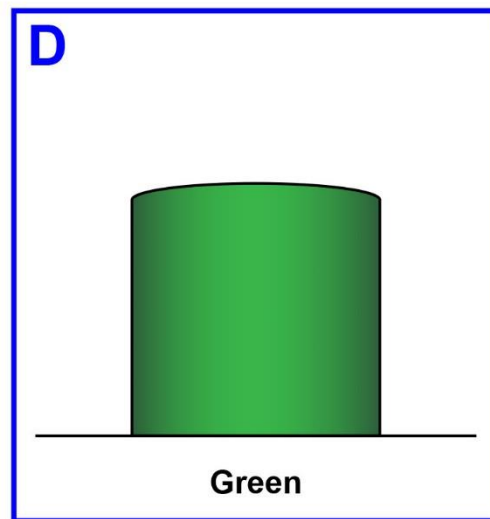
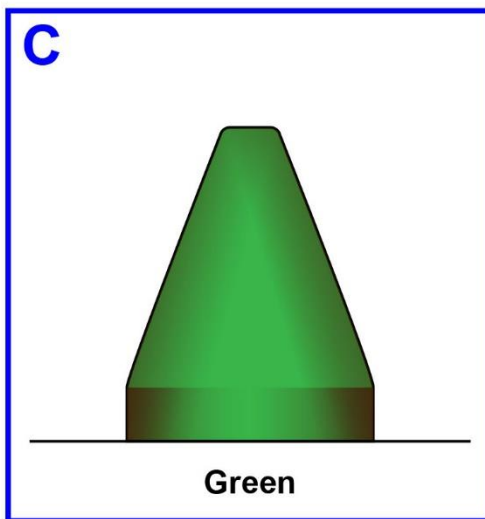
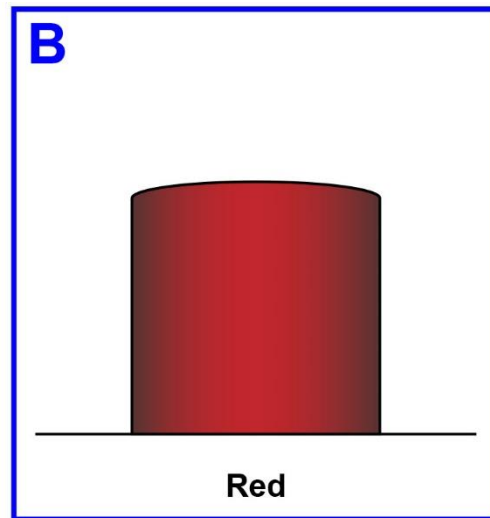
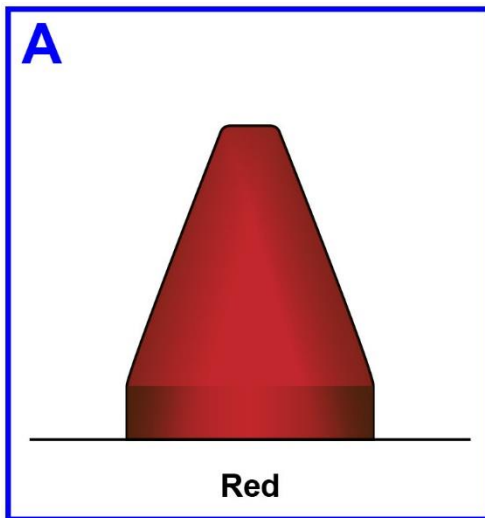
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Page 19 of 22

9/6/2018

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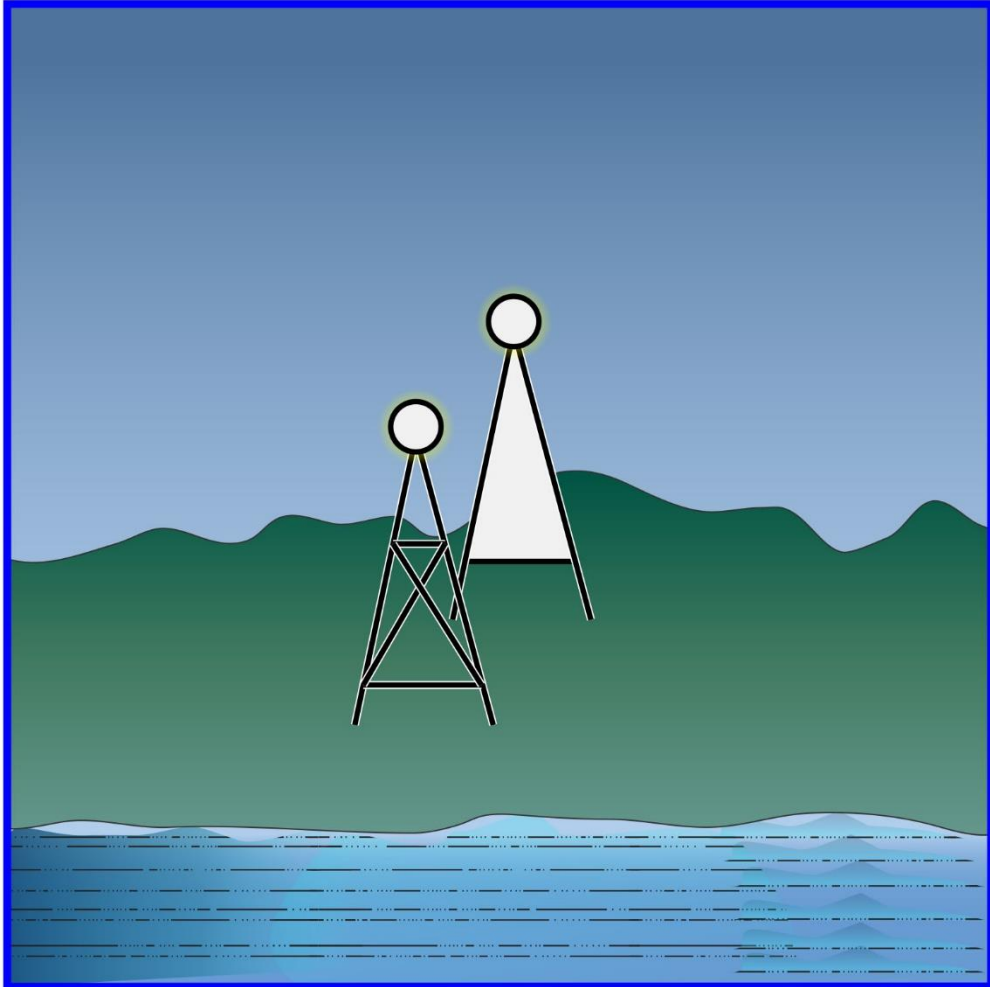
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Page 20 of 22

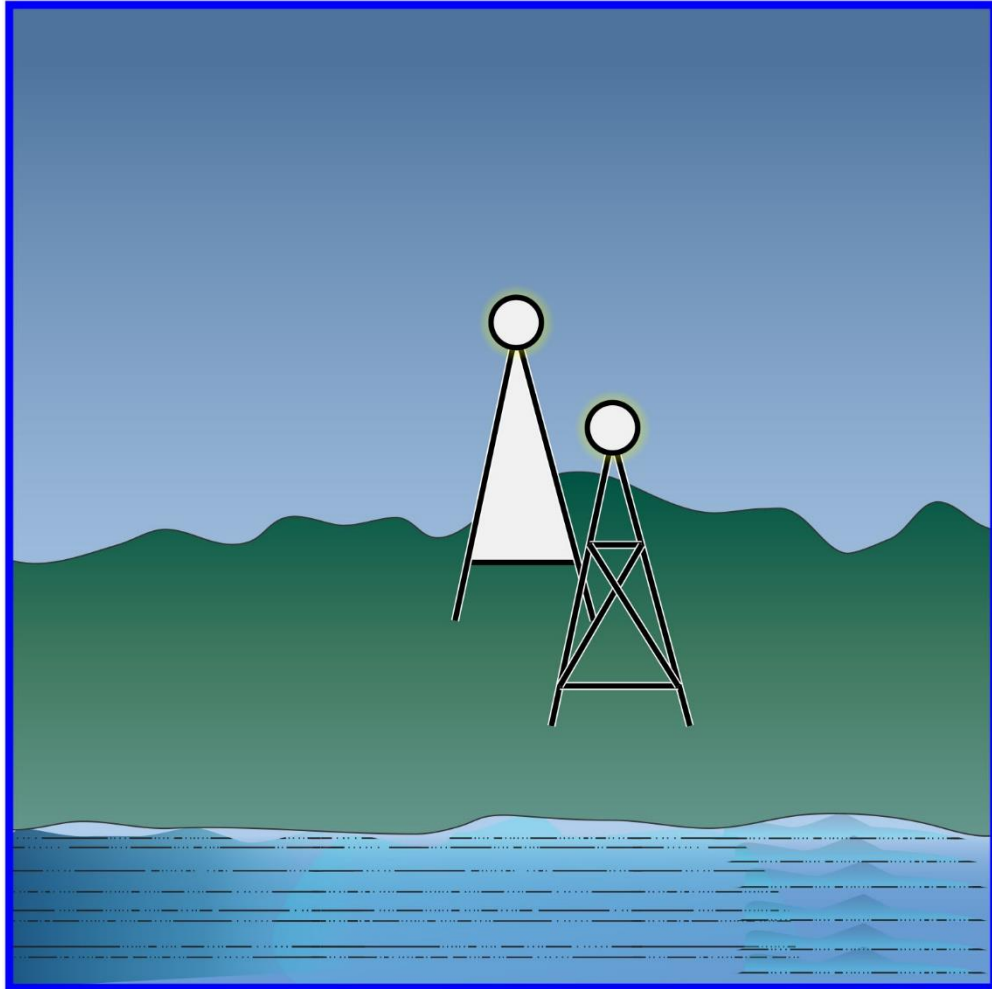
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