

U.S.C.G. Merchant Marine Exam  
Second/Third Mate Unlimited Tonnage  
Q114 Navigation General-Oceans  
(Sample Examination)

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

1. Under the IALA-A Buoyage system, a buoy marking the starboard side of the channel when approaching from seaward may have a \_\_\_\_\_.

- (A) isophase light
- (B) triangular topmark
- (C) red light
- (D) can shape

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

2. Deviation in a compass is caused by the \_\_\_\_\_.

- (A) influence of the magnetic materials of the vessel
- (B) earth's magnetic field
- (C) vessel's heading
- (D) vessel's geographic position

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

3. Above-normal tides near the center of a hurricane may be caused by the \_\_\_\_\_.

- (A) jet stream
- (B) storm surge
- (C) torrential rains
- (D) high barometric pressure

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

4. The largest waves (heaviest chop) will usually develop where the wind blows \_\_\_\_\_.

- (A) at right angles to the flow of the current
- (B) over slack water
- (C) against the flow of the current
- (D) in the same direction as the flow of the current

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

5. Squall lines with an almost unbroken line of threatening dark clouds and sharp changes in wind direction, generally precede a(n) \_\_\_\_\_.

- (A) occluded front
- (B) fast-moving cold front
- (C) slow-moving warm front
- (D) stationary front

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

6. You take a bearing of  $142^\circ$  and  $259^\circ$  of two objects. Which bearing of a third object will give the best fix?
- (A)  $238^\circ$
  - (B)  $081^\circ$
  - (C)  $234^\circ$
  - (D)  $201^\circ$

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

7. The equation of time is 12m 00s and the mean Sun is ahead of the apparent Sun. If you are on the central meridian of your time zone, at what zone time will the apparent Sun cross the meridian?
- (A) 1200
  - (B) 1148
  - (C) 1212
  - (D) It cannot be determined from the information given.

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

8. While taking weather observations, you determine that the wind is blowing from the northeast. You would record the wind direction in the weather log as \_\_\_\_\_.
- (A)  $045^\circ$
  - (B)  $090^\circ$
  - (C)  $135^\circ$
  - (D)  $225^\circ$

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

9. The Light List indicates that a dayboard is a type TR-SY. You should \_\_\_\_\_.
- (A) leave it to port when southbound on the Atlantic portions of the ICW
  - (B) expect a daymark with no lateral significance
  - (C) pass it close aboard on either side
  - (D) look for a dayboard of type TR-TY to form a range

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

10. According to Buys Ballot's law, when an observer in the Northern Hemisphere experiences a northeast wind the center of low pressure is located to the \_\_\_\_\_.
- (A) northeast
  - (B) west-southwest
  - (C) northwest
  - (D) south-southeast

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

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

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

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

**12.** 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  $5^{\circ}$  west. If the heading of your vessel at the time of the sighting is  $344^{\circ}$  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.*

**13.** What wind reverses directions seasonally?

- (A) Monsoon winds
- (B) Secondary winds
- (C) Hooked trades
- (D) Jet stream

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

**14.** You should log all barometer readings taken at sea \_\_\_\_\_.

- (A) regularly
- (B) more often under changeable weather conditions
- (C) at least once during each watch
- (D) All of the above

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

**15.** A marine sextant has the index arm set at zero and the reflected image of the horizon forms a continuous line with the actual image. When the sextant is rotated about the line of sight the images separate. The sextant has \_\_\_\_\_.

- (A) error of perpendicularity
- (B) side error
- (C) centering error
- (D) prismatic error

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

**16.** A great circle crosses the equator at 134°E. It will also cross the equator at what other longitude?

- (A) 134°W
- (B) 46°W
- (C) 34°E
- (D) 124°W

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

**17.** While taking weather observations, you determine that the wind is coming from the west. In the weather log, you would record the wind direction as \_\_\_\_\_.

- (A) 000°
- (B) 090°
- (C) 180°
- (D) 270°

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

**18.** Which of the following must the electronic chart of an ECDIS display, as required by IMO/IHO?

- (A) Hydrography
- (B) Ferry routes
- (C) Regulatory boundaries
- (D) All of the above

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

**19.** Information about direction and velocity of rotary tidal currents is found in the \_\_\_\_\_.

- (A) Tidal Current Tables
- (B) Mariner's Guide
- (C) Tide Tables
- (D) Nautical Almanac

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

- 20.** If the gyrocompass error is east, what describes the error and the correction to be made to gyrocompass headings to obtain true headings?
- (A) The readings are too high (large numerically) and the amount of the error must be added to the compass to obtain true
  - (B) The readings are too low and the amount of the error must be subtracted from the compass to obtain true
  - (C) The readings are too low (small numerically) and the amount of the error must be added to the compass to obtain true
  - (D) The readings are too high and the amount of the error must be subtracted from the compass to obtain true

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

- 21.** Your Electronic Plotting Aid (EPA) has automatic speed inputs from the log. Due to currents, the log is indicating a faster speed than the speed over the ground. What should you expect under these circumstances?
- (A) The generated TCPA will be later than the actual TCPA.
  - (B) The targets true course vector will be in error.
  - (C) The range of initial target acquisition will be less than normal.
  - (D) The generated CPA will be less than the actual CPA.

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

- 22.** In the IALA Maritime Buoyage System, what is a red and white vertically-striped buoy used to indicate?
- (A) special mark not primarily used for navigation
  - (B) safe water mark
  - (C) cardinal mark
  - (D) isolated danger mark

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

- 23.** What is characteristic of an isophase light?
- (A) 1 sec. flash, 1 sec. eclipse
  - (B) 2 sec. flash, 5 sec. eclipse
  - (C) 4 sec. flash, 2 sec. eclipse, 3 sec. flash, 2 sec. eclipse
  - (D) 6 sec. flash, 3 sec. eclipse

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

**24.** The values of the Greenwich hour angle and declination, tabulated in all almanacs, are for the \_\_\_\_\_.

- (A) centers of the various celestial bodies
- (B) lower limb of the Sun and Moon; center of the stars and planets
- (C) upper limb of a celestial body
- (D) lower limb of a celestial body

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

**25.** Compass deviation is caused by \_\_\_\_\_.

- (A) magnetism within the vessel
- (B) misalignment of the compass
- (C) a dirty compass housing
- (D) magnetism from the earth's magnetic field

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

**26.** IN REGION A of the IALA Buoyage System, when entering from seaward, the starboard side of a channel would be marked by a \_\_\_\_\_.

- (A) green conical buoy
- (B) red conical buoy
- (C) red can buoy
- (D) green can buoy

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

**27.** A towing vessel is NOT required to be fitted with radar if it is \_\_\_\_\_.

- (A) towing alongside
- (B) used occasionally to assist vessels in distress
- (C) less than 49 feet in length
- (D) used solely for pollution response

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

**28.** In waters where the cardinal system is used you would expect to find danger \_\_\_\_\_.

- (A) lying to the east of an eastern quadrant buoy
- (B) lying to the south of a northern quadrant buoy
- (C) lying to the south of an eastern quadrant buoy
- (D) beneath or directly adjacent to the buoy

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

**29.** Which type of precipitation is a product of the violent convection found in thunderstorms?

- (A) Sleet
- (B) Hail
- (C) Freezing Rain
- (D) Snow

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

**30.** What should you apply to a fathometer reading to determine the depth of water?

- (A) Subtract the sea water correction.
- (B) Add the draft of the vessel.
- (C) Add the sea water correction.
- (D) Subtract the draft of the vessel.

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

**31.** A single line of position combined with a dead-reckoning position results in a(n) \_\_\_\_\_.

- (A) running fix
- (B) assumed position
- (C) estimated position
- (D) fix

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

**32.** 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.*

**33.** The annual change in variation for an area can be found in \_\_\_\_\_.

- (A) the center of the compass rose on a chart of the area
- (B) the handbook for Magnetic Compass Adjustment, Pub 226
- (C) the compass deviation table
- (D) Variation does not change.

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

**34.** When your vessel is on the storm track but behind the storm's center the \_\_\_\_\_.

- (A) barometer rises
- (B) wind speed decreases
- (C) wind direction remains steady
- (D) All of the above

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

**35.** Under the IALA Buoyage Systems, the topmark of a red and white vertically-striped buoy shall be \_\_\_\_\_.

- (A) X-shaped
- (B) a single red cone
- (C) two black spheres
- (D) a single red sphere

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

**36.** What is the length of a nautical mile?

- (A) 5,280 feet
- (B) 2,000 yards
- (C) 1,800 meters
- (D) 6,076 feet

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

**37.** Which type of cloud is the classic "thunderhead"?

- (A) Cumulonimbus
- (B) Altostratus
- (C) Stratus
- (D) Cirrus

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

**38.** Complete information on weather broadcasts throughout the world is contained in \_\_\_\_\_.

- (A) the Notice to Mariners
- (B) the daily weather map
- (C) your local newspaper
- (D) Selected Worldwide Marine Weather Broadcasts

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

**39.** Lines on a chart which connect points of equal magnetic variation are called \_\_\_\_\_.

- (A) magnetic latitudes
- (B) magnetic declinations
- (C) isogonic lines
- (D) dip

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

**40.** While proceeding along the Mediterranean coast of Spain, you sight the black and yellow buoy shown in illustration D020NG below. Your course is  $039^{\circ}\text{T}$ , and the buoy bears  $053^{\circ}\text{T}$ . What action should you take?

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

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

**41.** What indicates a dual purpose buoy?

- (A) Green buoy with a yellow square
- (B) Red and white vertically-striped buoy with a red spherical topmark
- (C) Red and white vertically-striped buoy with a vertical yellow stripe
- (D) Red buoy with a horizontal yellow band

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

**42.** You are underway on course  $050^{\circ}\text{T}$  and your maximum speed is 12 knots. The eye of a hurricane bears  $080^{\circ}\text{T}$ , 100 miles from your position. The hurricane is moving towards  $265^{\circ}\text{T}$  at 22 knots. What course should you steer at 12 knots to have the maximum CPA?

- (A)  $219^{\circ}$
- (B)  $208^{\circ}$
- (C)  $199^{\circ}$
- (D)  $190^{\circ}$

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

**43.** How can you estimate the position of a tropical storm's center?

- (A) using shipboard radar
- (B) observe the wind direction and apply Buys Ballot's law
- (C) With a radio weather bulletin or weather fax
- (D) All of the above

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

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

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

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

**45.** What is a common unit of measure for atmospheric pressure?

- (A) centimeters
- (B) Feet
- (C) Inches
- (D) Degrees

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

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

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

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

**47.** While on watch, you notice that the air temperature is dropping and is approaching the dew point. Which type of weather should be forecasted?

- (A) Heavy rain
- (B) Sleet
- (C) Fog
- (D) Hail

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

**48.** Weather conditions in the middle latitudes generally move \_\_\_\_\_.

- (A) eastward
- (B) southward
- (C) westward
- (D) northward

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

**49.** Under the IALA-B Buoyage System, when entering from seaward a lateral system buoy to be left to port may display which of the topmarks shown in illustration D046NG below?

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

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

**50.** Lines drawn through points on the Earth having the same atmospheric pressure are known as \_\_\_\_\_.

- (A) millibars
- (B) isothermal
- (C) seismics
- (D) isobars

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

**51.** Which table is NOT found in the U.S. Coast Pilots?

- (A) Meteorological table
- (B) Climatological table
- (C) Coastwise distance table
- (D) Luminous range table

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

**52.** 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 in west longitude and east in east longitude
- (D) west

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

**53.** The dividing meridian between zone descriptions -7 and -8 is \_\_\_\_\_.

- (A) 112°30'E
- (B) 118°30'E
- (C) 120°00'E
- (D) 116°30'W

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

**54.** When using the Electronic Plotting Aid (EPA) in heavy rain, which action should you take?

- (A) Navigate as though the effective range of the radar has been reduced.
- (B) Increase the STC setting to reduce close-in spurious signals.
- (C) Increase the radar gain to pick up weak echoes through the rain.
- (D) Increase the range of the inner and outer guard rings.

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

**55.** The First Point of Aries is the position of the Sun on the celestial sphere on or about \_\_\_\_\_.

- (A) September 21
- (B) December 21
- (C) June 21
- (D) March 21

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

**56.** A celestial body will cross the prime vertical circle when the latitude is numerically \_\_\_\_\_.

- (A) less than the declination and both are of the same name
- (B) greater than the declination and both are of the same name
- (C) less than the declination and both are of contrary name
- (D) greater than the declination and both are of contrary name

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

**57.** The dew point is reached when the \_\_\_\_\_.

- (A) atmospheric pressure is 14.7 lbs. per square inch
- (B) relative humidity reaches 50%
- (C) temperature of the air equals the temperature of the seawater
- (D) air becomes saturated with water vapor

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

**58.** Which indication on the barometer is most meaningful in forecasting weather?

- (A) The direction and rate of change of barometric pressure
- (B) The actual barometric pressure
- (C) The words "Fair -- Change -- Rain"
- (D) The relative humidity

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

**59.** Information about currents around Pacific Coast ports of the U.S. is found in the \_\_\_\_\_.

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

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

**60.** The phase correction should be applied to sights of Venus and Mars \_\_\_\_\_.

- (A) during day time observations only
- (B) at all times
- (C) when observed at altitudes of less than 25°
- (D) during twilight observations only

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

**61.** You are steering 143°T, and a light is picked up dead ahead at a distance of 18.2 miles at 2006. You change course to pass the light 5.5 miles off abeam to port. If you are making 14.5 knots, what is your ETA at a position 5.5 miles off the light?

- (A) 2115
- (B) 2118
- (C) 2121
- (D) 2124

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

**62.** Weather systems in the middle latitudes generally travel from \_\_\_\_\_.

- (A) west to east
- (B) east to west
- (C) north to south
- (D) None of the above

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

**63.** 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.*

**64.** On navigational aids, what does the light characteristic "Fl(2+1)" mean?

- (A) A light showing groups of two or more flashes at regular intervals
- (B) A fixed light varied at regular intervals by groups of two or more flashes of greater brightness
- (C) Light flashes combined in groups, with a different number of flashes in each group
- (D) A flashing light combined with a fixed light of greater brightness

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

**65.** On a chart, the characteristic of the light on a lighthouse is shown as flashing white with a red sector. The red sector \_\_\_\_\_.

- (A) is used to identify the characteristics of the light
- (B) serves no significant purpose
- (C) indicates a danger area
- (D) indicates the limits of the navigable channel

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

**66.** Which information is found in the chart title?

- (A) Number of the chart
- (B) Variation information
- (C) Edition date
- (D) Survey information

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

**67.** A great circle track provides the maximum saving in distance on \_\_\_\_\_.

- (A) southerly courses in high latitudes
- (B) westerly courses in low latitudes
- (C) easterly courses in low latitudes that cross the equator
- (D) easterly courses in high latitudes

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

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

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

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

**69.** When using a mechanical (windup type) marine chronometer, how often should it be reset?

- (A) At the start of each voyage
- (B) Only when it is overhauled
- (C) Whenever the chronometer error exceeds approximately four minutes
- (D) If the chronometer rate changes from gaining to losing or vice versa

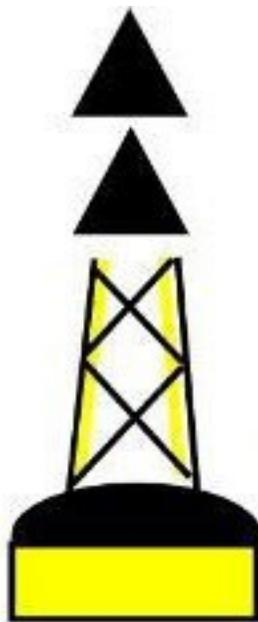
*If choice B is selected set score to 1.*

**70.** Preferred channel buoys indicate the preferred channel to transit by \_\_\_\_\_.

- (A) the location of the buoy in the channel junction
- (B) the color of their top band
- (C) odd or even numbers
- (D) the buoy's light rhythms

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

## D020NG



# National Maritime Center

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## D041NG

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|---|--|--|--|--|--|--|
| WS FORM B-80 (5-94)<br>PRES. BY WMO DIRECTIVES  |  | <b>WEATHER REPORT FOR IMMEDIATE TRANSMISSION</b>                           |  |  |  | U.S. DEPARTMENT OF COMMERCE<br>NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION<br>NATIONAL WEATHER SERVICE |
| 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>      | i <sub>R</sub> i <sub>x</sub> hVV                                | Nddff  |
| BBXX  |  |  | 99   |  | 4  |  |
| ØØff  | 1S <sub>n</sub> TTT  | 2S <sub>n</sub> T <sub>d</sub> T <sub>d</sub> T <sub>d</sub>               | 4PPPP  | 5appp  | 7 <sub>ww</sub> W <sub>1</sub> W <sub>2</sub>                    | 8N <sub>r</sub> C <sub>L</sub> C <sub>M</sub> C <sub>H</sub>   |
| 222D <sub>s</sub> V <sub>s</sub>  | ØS <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> | 6I <sub>2</sub> E <sub>s</sub> E <sub>s</sub> R <sub>s</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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