

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

Master Less than 500-1600 Gross Registered Tons

Q124 Navigation General - Oceans

(Sample Examination)

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

**1.** As the temperature for a given mass of air increases, the \_\_\_\_\_.

- (A) dew point decreases
- (B) relative humidity decreases
- (C) dew point increases
- (D) relative humidity increases

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

**2.** You are on a vessel at 0400 ZT on 3 July, and the ZD for your position is -8. What is the GMT?

- (A) 1200, 2 July
- (B) 1200, 3 July
- (C) 2000, 2 July
- (D) 2000, 3 July

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

**3.** Priming of the tides occurs \_\_\_\_\_.

- (A) when the Earth, Moon, and Sun are lying approximately on the same line
- (B) when the Moon is between first quarter and full and between third quarter and new
- (C) when the Moon is between new and first quarter and between full and third quarter
- (D) at times of new and full Moon

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

**4.** Permanent magnetism is caused by \_\_\_\_\_.

- (A) the earth's magnetic field affecting the ship's hard iron during construction
- (B) the vertical component of the earth's magnetic field acting on the vertical soft iron
- (C) operation of electrical equipment and generators on board ship
- (D) the horizontal component of the earth's magnetic field acting on the horizontal soft iron

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

**5.** In which month will the equatorial counter current be strongest?

- (A) April
- (B) January
- (C) August
- (D) October

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

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

\_\_\_\_\_.

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

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

7. What is the average speed of the movement of a hurricane following the recurvature of its track?

- (A) Over 60 knots
- (B) 40 to 50 knots
- (C) 5 to 10 knots
- (D) 20 to 30 knots

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

8. Radiation fog \_\_\_\_\_.

- (A) dissipates during the evening
- (B) is thinnest at the surface
- (C) always forms over water
- (D) is formed by a temperature inversion

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

9. A cyclone in its final stage of development is called a(n) \_\_\_\_\_.

- (A) polar cyclone
- (B) anticyclone
- (C) tornado
- (D) occluded cyclone or occluded front

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

10. Which statement about the gyrocompass is FALSE?

- (A) If an error exists, it is the same on all headings.
- (B) Its accuracy remains the same at all latitudes.
- (C) It can be used near the Earth's magnetic poles.
- (D) It seeks the true meridian.

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

**11.** Some locations maintain a zone time of -13. What are the zone time and date if the Greenwich time and date are 0152, 10 January?

- (A) 0052, 9 January
- (B) 0258, 9 January
- (C) 1452, 10 January
- (D) 0052, 11 January

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

**12.** The safest and most prudent procedure to follow while navigating in the vicinity of a tropical cyclone is to \_\_\_\_\_.

- (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

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

**13.** 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) south of the buoy
- (B) east of the buoy
- (C) north of the buoy
- (D) west of the buoy

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

**14.** With respect to failure warnings and status indications, GPS receivers should provide, at a minimum, \_\_\_\_\_.

- (A) an indication within 5 seconds if the specified HDOP has been exceeded
- (B) a differential GPS status indication of the receipt of DGPS signals
- (C) a warning of loss of position
- (D) All of the above

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

**15.** The Coast Guard Captain of the Port has excluded all traffic from a section of a port, while a regatta is taking place. The buoys marking this exclusion area will be \_\_\_\_\_.

- (A) yellow
- (B) orange and white
- (C) nun- or can-shaped to conform to the overall direction of navigation
- (D) marked with a spherical topmark

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

**16.** Apparent altitude is sextant altitude corrected for \_\_\_\_\_.

- (A) visibility and magnitude
- (B) parallax and personal error
- (C) inaccuracies in the reading and reference level
- (D) All of the above are correct

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

**17.** While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships fog horn 2 1/2 seconds after the signal was sounded. What is the distance to the shore?

- (A) 225 yards
- (B) 460 yards
- (C) 750 yards
- (D) 910 yards

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

**18.** Under the IALA - A Buoyage System, a buoy used as a port hand mark would not show which light characteristic?

- (A) Group Flashing (2 + 1)
- (B) Quick flashing
- (C) Isophase
- (D) Long flashing

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

**19.** Which publication lists Class I and II private aids to navigation in or along navigable waters of the United States?

- (A) Sailing Directions
- (B) Aids to Navigation Manual
- (C) Light List
- (D) List of Private Aids

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

**20.** When a buoy marks a channel bifurcation, the preferred channel is NOT indicated by \_\_\_\_\_.

- (A) the light color of a lighted buoy
- (B) the shape of an unlighted buoy
- (C) the color of the topmost band
- (D) whether the number is odd or even

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

**21.** A buoy marking a wreck will show a(n) \_\_\_\_\_.

- (A) continuous quick white light and may be numbered
- (B) occulting green light and may be lettered
- (C) white light FL (2) and a topmark of 2 black spheres
- (D) yellow light and will be numbered

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

**22.** You are in a channel inbound from sea. A daymark used to mark a channel junction, when the preferred channel is to port will have the shape indicated by what letter in illustration D045NG below?

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

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

**23.** You are underway and pass by a lighthouse. Its light, which was white since you first sighted it, changes to red. This means \_\_\_\_\_.

- (A) it is the identifying light characteristic of the lighthouse
- (B) the light is characterized as alternately flashing
- (C) you have entered an area of shoal water or other hazard
- (D) the lighthouse has lost power and has switched to emergency lighting

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

**24.** A chart with a scale of 1:80,000 would fall into the category of a \_\_\_\_\_.

- (A) general chart
- (B) sailing chart
- (C) coastal chart
- (D) harbor chart

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

**25.** The symbol which appears beside a light on a chart reads "Gp Fl R (2) 10 sec 160 ft 19M". Which characteristic does the light possess?

- (A) It is visible two nautical miles.
- (B) Its distinguishing number is "19M".
- (C) It flashes once every ten seconds.
- (D) It has a red light.

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

**26.** An air mass that has moved down from Canada would most likely have the symbols \_\_\_\_\_.

- (A) mPk
- (B) cTk
- (C) cTw
- (D) cPk

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

**27.** While underway you sight a light  $11^\circ$  on your port bow at a distance of 12 miles. Assuming you make good your course, what will be your distance off the light when abeam?

- (A) 4.5 miles
- (B) 2.3 miles
- (C) 3.9 miles
- (D) 3.1 miles

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

**28.** Uniform, grayish-white cloud sheets that cover large portions of the sky, and are responsible for a large percentage of the precipitation in the temperate latitudes, are called \_\_\_\_\_.

- (A) altostratus
- (B) cirrostratus
- (C) altocumulus
- (D) cirrocumulus

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

**29.** Indications of the master gyrocompass are sent to remote repeaters by the \_\_\_\_\_.

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

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

**30.** In which source could you find the vertical clearance of a bridge on the Ohio River?

- (A) Great Lakes Pilot
- (B) Coast Pilot of the Gulf of Mexico
- (C) Notice to Mariners
- (D) Light List of the Mississippi River System

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

**31.** You are attempting to locate your position relative to a hurricane in the Northern Hemisphere. If the wind direction remains steady, but with diminishing velocity, you are most likely \_\_\_\_\_.

- (A) on the storm track ahead of the center
- (B) in the left semicircle
- (C) in the right semicircle
- (D) on the storm track behind the center

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

**32.** The chart of a beach area shows a very steep slope to the underwater beach bottom. Which type of breakers can be expected when trying to land a boat on this beach?

- (A) Surging
- (B) Converging
- (C) Spilling
- (D) Plunging

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

**33.** 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) Long range radio navigational warnings are usually broadcast by radiotelephone, radiotelegraph, and radio-teletypewriter.
- (C) NAVAREA warnings concern only coastal navigation and inland navigation in large bays or sounds such as Puget Sound.
- (D) The topics for warnings included in HYDROLANTS, HYDROPACS, and NAVAREA warnings are the same.

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

**34.** Information for updating nautical charts is primarily found in the \_\_\_\_\_.

- (A) nautical chart catalogs
- (B) Coast Pilots
- (C) Notice to Mariners
- (D) Sailing Directions

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

**35.** When changing from a compass course to a true course you should apply \_\_\_\_\_.

- (A) a correction for the direction of current set
- (B) variation
- (C) deviation
- (D) variation and deviation

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

**36.** What is a nonadjustable error of the sextant?

- (A) Index error
- (B) Error of collimation
- (C) Prismatic error
- (D) Side error

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

**37.** You are enroute to assist vessel A. Vessel A is underway at 4.5 knots on course 233°T, and bears 264°T, 68 miles from you. What is the time to intercept if you make 13 Knots?

- (A) 6h 31m
- (B) 6h 47m
- (C) 7h 03m
- (D) 7h 37m

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

**38.** Your radar indicates a target; however, there is no visible object at the point indicated. A large mountain, approximately 50 miles away on the same bearing as the target, is breaking the horizon. You should suspect the radar target is caused by \_\_\_\_\_.

- (A) sub-refraction
- (B) a submerged submarine
- (C) ionospheric skip waves
- (D) ducting

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

**39.** Which of the following statements is TRUE regarding automatic identification systems (AIS)?

- (A) The master may, at his/her discretion, turn off the AIS if he/she believes that it may compromise the safety or security of the vessel.
- (B) AIS is always required to be operating if the vessel is within 100 nautical miles of the coastline.
- (C) Under no circumstances shall AIS be turned off while underway as this could endanger the vessel and those around her.
- (D) AIS is always required to be operating if the vessel is in or in the vicinity of a VTS area.

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

**40.** Your vessel is steering course 299°psc, variation for the area is 7°W, and deviation is 4°W. The wind is from the southwest, producing a 3° leeway. What true course are you making good?

- (A) 291°T
- (B) 299°T
- (C) 296°T
- (D) 313°T

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

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

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

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

**42.** A mercurial barometer at sea is subject to rapid variations in height ("pumping") due to the pitch and roll of the vessel. To avoid this error, measurements of atmospheric pressure at sea are usually measured with a(n) \_\_\_\_\_.

- (A) aneroid barometer
- (B) cistern barometer
- (C) fortin barometer
- (D) syphon barometer

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

**43.** Your facsimile prognostic chart indicates that you will cross the cold front of a low pressure system in about 24 hours. You should \_\_\_\_\_.

- (A) alter course to remain in the navigable semicircle
- (B) expect clear weather, with steady winds and pressure, until the front passes
- (C) prepare for gusty winds, thunderstorms, and a sudden wind shift
- (D) expect to see cirrus clouds followed by altostratus and nimbostratus clouds

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

**44.** In the Northern Hemisphere, gusty winds shifting clockwise, a rapid drop in temperature, thunderstorms or rain squalls in summer (frequent rain/snow squalls in winter) then a rise in pressure followed by clearing skies, indicate the passage of a(n) \_\_\_\_\_.

- (A) cold front
- (B) anticyclone
- (C) warm front
- (D) tropical cyclone

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

**45.** In low latitudes, the low(s) of the diurnal variation of pressure occur(s) at \_\_\_\_\_.

- (A) noon and midnight
- (B) 0400 and 1600
- (C) noon
- (D) 1000 and 2200

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

**46.** The winds with the greatest effect on the set, drift, and depth of the equatorial currents are the \_\_\_\_\_.

- (A) doldrums
- (B) prevailing westerlies
- (C) trade winds
- (D) horse latitudes

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

**47.** The belt of light and variable winds between the westerly wind belt and the northeast trade winds is called the \_\_\_\_\_.

- (A) subtropical high pressure belt
- (B) polar frontal zone
- (C) intertropical convergence zone
- (D) doldrum belt

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

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

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

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

**49.** "Revolution" is the \_\_\_\_\_.

- (A) wobbling of the Earth about its axis
- (B) motion of a celestial body in its orbit
- (C) motion of bodies in the solar system relative to the stars
- (D) spinning of a celestial body about its axis

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

**50.** The new Moon cannot be seen because the Moon is \_\_\_\_\_.

- (A) in the opposite direction of the Sun
- (B) between the Earth and the Sun
- (C) below the horizon
- (D) at quadrature

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

**51.** In the horizon system of coordinates what is equivalent to the declination of the equator system?

- (A) Zenith distance
- (B) Nadir
- (C) Altitude
- (D) Azimuth angle

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

**52.** A phase correction may be applicable to correct the sextant altitude correction of \_\_\_\_\_.

- (A) the Sun
- (B) some planets
- (C) any star
- (D) third magnitude stars only

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

**53.** During daylight savings time the meridian used for determining the time is located farther \_\_\_\_\_.

- (A) east
- (B) west
- (C) west in west longitude and east in east longitude
- (D) east in west longitude and west in east longitude

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

**54.** What is the major problem with taking high altitude sun observations?

- (A) Possible errors due to unusual refraction may exist.
- (B) Rapidly changing altitudes make it difficult to get an accurate altitude.
- (C) The tables are not as accurate due to inherent errors in the spherical triangle at high altitudes.
- (D) It is difficult to establish the point where the sextant is vertical to the horizon.

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

**55.** In high latitudes, celestial observations can be made over a horizon covered with pack ice by bringing the sun tangent to the ice and \_\_\_\_\_.

- (A) using a dip correction from table 22 in Bowditch Vol. II
- (B) using a dip correction based on the height of eye above the ice
- (C) adding 30° of arc to the sight
- (D) doubling the semidiameter correction

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

**56.** Discounting slip, if your vessel is turning RPM for 10 knots and making good a speed of 10 knots, the current could be \_\_\_\_\_.

- (A) slack
- (B) with you at 10 knots
- (C) against you at 10 knots
- (D) with you at 2 knots

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

**57.** You are running parallel to the coast and take a running fix using bearings of the same object. If you are making less speed than used for the running fix, in relation to the position indicated by the fix, you will be \_\_\_\_\_.

- (A) on the track line ahead of the fix
- (B) farther from the coast
- (C) closer to the coast
- (D) on the track line behind the fix

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

**58.** You take a bearing of  $086^\circ$  of a lighthouse. What bearing of another object would give the best fix?

- (A)  $000^\circ$
- (B)  $066^\circ$
- (C)  $112^\circ$
- (D)  $271^\circ$

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

**59.** While steering a course of  $150^\circ\text{T}$ , you wish to observe the Sun for a speed check. What would the azimuth have to be?

- (A)  $060^\circ\text{T}$
- (B)  $240^\circ\text{T}$
- (C)  $090^\circ\text{T}$
- (D)  $150^\circ\text{T}$

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

**60.** A latitude line will be obtained by observing a body \_\_\_\_\_.

- (A) on the celestial horizon
- (B) at lower transit
- (C) on the Greenwich meridian
- (D) on the prime vertical

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

- 61.** You are underway in an area where the charted depth is 8 fathoms. You compute the height of tide to be -4.0 feet. The draft of your vessel is 5.0 feet (1.52 meters). You determine the depth of the water beneath your keel to be \_\_\_\_\_.
- (A) 47 feet (14.3 meters)
  - (B) 39 feet (11.9 meters)
  - (C) 57 feet (17.4 meters)
  - (D) 43 feet (13.1 meters)

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

- 62.** When using horizontal sextant angles of three objects to fix your position, an indeterminate position will result in which situation?
- (A) The vessel is inside of a triangle formed by the objects.
  - (B) The vessel is outside of a triangle formed by the objects.
  - (C) A circle will pass through your position and the three objects.
  - (D) The objects lie in a straight line.

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

- 63.** When using a buoy as an aid to navigation which of the following should be considered?
- (A) The buoy should be considered to always be in the charted location.
  - (B) The buoy may not be in the charted position.
  - (C) If the light is flashing, the buoy should be considered to be in the charted location.
  - (D) The buoy should be considered to be in the charted position if it has been freshly painted.

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

- 64.** A great circle crosses the equator at 173°E. It will also cross the equator at what other longitude?
- (A) 173°W
  - (B) 7°W
  - (C) 73°W
  - (D) 73°E

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

- 65.** The upper vertex of a great circle track is in LONG 156°00'E. Sailing eastward, the great circle track will cross the equator in LONG \_\_\_\_\_.
- (A) 66°00'E
  - (B) 110°00'W
  - (C) 114°00'W
  - (D) 66°00'W

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

**66.** On a voyage from Halifax, N.S., to Dakar, West Africa, the Canary Current will \_\_\_\_\_.

- (A) set the vessel to the left
- (B) furnish additional thrust in the form of a fair or following current
- (C) offer resistance in the form of a head current
- (D) set the vessel to the right

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

**67.** The velocity of a rotary tidal current will be decreased when the Moon is \_\_\_\_\_.

- (A) new
- (B) full
- (C) at apogee
- (D) All of the above

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

**68.** The distance between the surface of the water and the tidal datum is the \_\_\_\_\_.

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

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

**69.** You swung ship and compared the magnetic compass against the gyro compass to find deviation. Gyro error is 2°W. The variation is 8°W. Find the deviation on a gyro heading of 039°.

HEADING	HEADING	HEADING
<u>PSC-PGC</u>	<u>PSC-PGC</u>	<u>PSC-PGC</u>
358.5°-354°	122.5°-114°	239.5°-234°
030.5°-024°	152.0°-144°	269.0°-264°
061.5°-054°	181.0°-174°	298.0°-294°
092.0°-084°	210.0°-204°	327.5°-324°

- (A) 0.8°E
- (B) 0.5°W
- (C) 0.0°
- (D) 1.0°W

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

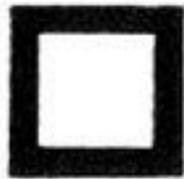
- 70.** Your vessel is proceeding up a channel, and you see a pair of range lights that are in line ahead. The chart indicates that the direction of this pair of lights is  $311^{\circ}\text{T}$ , and the variation is  $8^{\circ}\text{E}$ . If the heading of your vessel at the time of the sighting is  $305^{\circ}$  per standard magnetic compass, what is the correct deviation?
- (A)  $6^{\circ}\text{W}$
  - (B)  $2^{\circ}\text{E}$
  - (C)  $2^{\circ}\text{W}$
  - (D)  $6^{\circ}\text{E}$

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

## D026NG



## D045NG



A



B



C



D