

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

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

1. Why are low altitude sun sights not generally used?
- A. The glare on the horizon causes irradiation errors.
  - B. Errors due to unusual refraction may exist.
  - C. Modern sight reduction tables are not complete for low altitudes below 5°.
  - D. Sextants may have large errors at small angles of elevation.

Correct answer: B

2. The light characteristic of flashing is used in the Aids to Navigation System on the Western Rivers. Which example is required to utilize this characteristic?
- A. Daymarks with no lateral significance
  - B. Preferred channel buoys
  - C. Lights marking the right descending bank
  - D. Lights marking the left descending bank

Correct answer: C

3. During the month of October, which describes the Sun's declination?
- A. The declination is south and decreasing
  - B. The declination is north and increasing
  - C. The declination is north and decreasing
  - D. The declination is south and increasing

Correct answer: D

4. 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°T, and the variation is 11°E. If the heading of your vessel at the time of the sighting is 009° per standard magnetic compass, what is the correct deviation?
- A. 5°E
  - B. 5°W
  - C. 6°E
  - D. 6°W

Correct answer: D

5. How often is The Local Notice to Mariners updated?
- A. Usually monthly
  - B. Usually daily
  - C. Usually weekly
  - D. Usually semiannually

Correct answer: C

6. Ascending and descending air masses with different temperatures is part of an important heat transmitting process in our atmosphere. Which term is given to this process?
- A. Radiation
  - B. Convection
  - C. Barometric inversion
  - D. Conduction

Correct answer: B

7. Which kind of conditions would you observe as the eye of a storm passes over your vessel's position?
- A. Flat calm seas, heavy rain, light winds, and an extremely low barometer
  - B. Huge waves approaching from all directions, clearing skies, light winds, and high pressure
  - C. Flat calm seas, heavy rain, light winds, and high pressure
  - D. Huge waves approaching from all directions, clearing skies, light winds, and an extremely low barometer

Correct answer: D

8. As it approaches, what will a typical warm front bring?
- A. Rising temperatures and falling barometric pressure
  - B. Rising barometric pressure and temperatures
  - C. Falling temperature and pressure
  - D. Falling temperatures and rising pressure

Correct answer: A

9. Which agency publishes the Light Lists?
- A. United States Coast Guard
  - B. National Ocean Service
  - C. Oceanographic Office
  - D. Army Corps of Engineers

Correct answer: A

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

Correct answer: D

**11.** You are on course 042°T. To check the course of your vessel you should observe a celestial body on which bearing?

- A. 090°
- B. 132°
- C. 180°
- D. 222°

Correct answer: B

**12.** The owner or Master of a towing vessel shall ensure that all tests and inspections of gear take place. When are these actions required to be logged?

- A. Weekly, before 2400 Saturday
- B. Daily, at 0800 local zone time
- C. When a new Master assumes command
- D. Immediately after assuming the watch

Correct answer: C

**13.** While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships foghorn 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

Correct answer: B

**14.** The datum from which the predicted heights of tides are reckoned in the tide tables is the same as that used for the charts of the locality. The depression of the datum below mean sea level for Hampton Roads, Virginia is \_\_\_\_\_.

- A. 4.1 feet
- B. 1.2 feet
- C. between -.7 and +.5 feet
- D. between 1.9 and 3.2 feet

Correct answer: B

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

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

Correct answer: B

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

- A. Sighting a terrestrial range in line and comparing the observed bearing against the charted bearing
- B. 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
- C. Ensuring that the alignment marks on the inner face of the circle are in line with those on the repeater on relative bearings of  $000^\circ$  and  $090^\circ$
- D. Comparing observed azimuths at different altitudes with computed values at the times of observation to see if the difference is constant

Correct answer: D

**17.** You take a bearing of  $264^\circ$  of a lighthouse. What bearing of another object would give the best fix?

- A.  $289^\circ$
- B.  $350^\circ$
- C.  $120^\circ$
- D.  $081^\circ$

Correct answer: B

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

- A.  $0^\circ$
- B.  $180^\circ$
- C.  $45^\circ$
- D.  $90^\circ$

Correct answer: B

**19.** What does the expression "the air is saturated" mean?

- A. The relative humidity is 100%
- B. The precipitation has commenced
- C. The cloud cover is 100%
- D. The vapor pressure is at its maximum for the prevailing temperature

Correct answer: A

**20.** What is the term used for the horizontal angle between the magnetic meridian and the north-south line axis line of the magnetic compass?

- A. Dip
- B. Compass error
- C. Deviation
- D. Variation

Correct answer: C

**21.** What happens to the barometric pressure after a cold front passes?

- A. Drops, and the temperature drops
- B. Rises, and the temperature drops
- C. Rises, and the temperature rises
- D. Drops, and the temperature rises

Correct answer: B

**22.** You are outbound in a channel marked by a range astern. The range line is 309°T. You are steering 127°T and have the range in sight as shown in illustration D047NG below. What action should you take?

- A. Come left until the range comes in line then alter course to 125°T.
- B. Come right to 129°T.
- C. Come right to close the range then when on the range steer 129°T.
- D. Come left until the range comes in line then alter course to 129°T.

Correct answer: C

**23.** In some river mouths and estuaries, the incoming high-tide wave crest overtakes the preceding low-tide trough. This results in a wall of water proceeding upstream. Which term describes this occurrence?

- A. Surge
- B. Boundary wave
- C. Seiche
- D. Bore

Correct answer: D

**24.** 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. West of the buoy
- D. North of the buoy

Correct answer: A

**25.** The principal vertical circle is that great circle on the celestial sphere that passes through which of the following?

- A. The poles and Greenwich
- B. The zenith and the celestial body
- C. The zenith and the north and south poles
- D. The zenith and is parallel to the horizon

Correct answer: C

**26.** What does a wind vane on a moving vessel show?

- A. The estimated wind direction
- B. The apparent wind direction
- C. The dead reckoning wind direction
- D. The true wind direction

Correct answer: B

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

- A. In the opposite direction of the Sun
- B. Below the horizon
- C. Between the Earth and the Sun
- D. At quadrature

Correct answer: C

**28.** The error in a sextant altitude caused by refraction is greatest when the celestial body is in which location?

- A. Rising above 45° elevation
- B. High in the sky
- C. At or near transit
- D. Near the horizon

Correct answer: D

**29.** 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. 003°
- B. 227°
- C. 177°
- D. 363°

Correct answer: C

**30.** In which months will the North Equatorial Countercurrent be strongest?

- A. July and August
- B. April and May
- C. January and February
- D. October and November

Correct answer: A

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

- A. by follow-up system
- B. by transmitter
- C. by phantom element
- D. by azimuth motor

Correct answer: B

**32.** On a nautical chart, what does the inner ring of a compass rose indicate?

- A. Compass error
- B. Magnetic directions
- C. Deviation
- D. True directions

Correct answer: B

**33.** What is the standard atmospheric pressure as measured in inches of mercury?

- A. 29.92
- B. 500.0
- C. 760.0
- D. 1013.2

Correct answer: A

**34.** Under the U.S. Aids to Navigation System, which category is a yellow buoy?

- A. A safe water buoy
- B. A special mark
- C. A cardinal mark
- D. A junction buoy

Correct answer: B

**35.** Distance along a track line is measured on a Mercator chart by using which method?

- A. Use the longitude scale near the middle of the track line
- B. Use the latitude or longitude scale at the middle of the scale
- C. latitude scale at the mid-latitude of the chart
- D. Use the latitude scale near the middle of the track line

Correct answer: D

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

- A. 0°47'
- B. 1°12'
- C. 2°43'
- D. 3°52'

Correct answer: C

- 37.** You are plotting a running fix. The LOP to be run forward is an arc from a radar range, what technique should be used?
- A. The distance between LOP's should be added to the radar range and a new arc swung.
  - B. The arc should be converted into a straight line using offsets and then run forward.
  - C. An arc should never be run forward.
  - D. The position of the object observed should be advanced to the new time and a new arc swung using the radius of the old arc.

Correct answer: D

- 38.** You are on course  $180^{\circ}T$  and take a relative bearing of a lighthouse of  $225^{\circ}$ . What is the true bearing of the lighthouse?
- A.  $180^{\circ}$
  - B.  $270^{\circ}$
  - C.  $135^{\circ}$
  - D.  $045^{\circ}$

Correct answer: D

- 39.** What must the owner or Master do if any of the towing vessel's required navigational safety equipment fails during a voyage?
- A. Repair it at the earliest practicable time
  - B. Enter its failure in the log or other on-board record
  - C. Consider the state of the equipment in deciding whether it is safe for the vessel to proceed
  - D. All of the above

Correct answer: D

- 40.** You have been informed that dredging operations may be underway in your vicinity. Which buoy indicates the dredging area?
- A. White buoy with a green top
  - B. Yellow buoy
  - C. Yellow and black vertically striped buoy
  - D. White and international orange buoy

Correct answer: B

- 41.** Which is TRUE of the dangerous semicircle of a hurricane in the Northern Hemisphere?
- A. It is measured from true north clockwise to  $180^{\circ}T$
  - B. It is the area between the ship's heading and the bearing to the eye
  - C. It is measured from true north counterclockwise to  $180^{\circ}T$
  - D. It is the area of the storm that is to the right of the storm's track

Correct answer: D

- 42.** Yesterday you took a time tick using the 1200 GMT broadcast, and the chronometer read 11h 59m 59s. Today at the 1200 GMT time tick the chronometer read 00h 00m 01s. What is the chronometer error?
- A. Losing 2 seconds
  - B. Fast 1 second
  - C. Fast 2 seconds
  - D. Gaining 2 seconds

Correct answer: B

- 43.** While on a course of 349°T, a light bears 13° on your starboard bow at a distance of 10.8 miles. What course should you steer to pass 2.5 miles abeam of the light, leaving it to starboard?
- A. 002°
  - B. 349°
  - C. 323°
  - D. 336°

Correct answer: B

- 44.** What is TRUE concerning new editions of Light Lists?
- A. New editions are published by the National Ocean Service.
  - B. Supplements to new editions are issued monthly by the U.S. Coast Guard.
  - C. New editions are corrected through the date shown on the title page.
  - D. None of the above

Correct answer: C

- 45.** What does a barometer showing falling pressure indicate?
- A. The approach of a high-pressure system
  - B. A low dew point
  - C. The approach of a low-pressure system
  - D. A high dew point

Correct answer: C

- 46.** You are steering 154°pgc. The wind is southwest causing 4° leeway. The gyro error is 3°E, variation is 11°W and deviation is 7°E. What is the true course made good?
- A. 158°T
  - B. 161°T
  - C. 153°T
  - D. 164°T

Correct answer: C

**47.** The path that a vessel is expected to follow, represented on a chart by a line drawn from the point of departure to the point of arrival, is known by which term?

- A. Track line
- B. DR plot
- C. Estimated course
- D. Heading

Correct answer: A

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

- A. Height error only
- B. Instrument error and height error
- C. Instrument error and latitude correction
- D. Instrument error only

Correct answer: B

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

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

Correct answer: A

**50.** What is a sling psychrometer used to measure?

- A. The sea water temperature
- B. The dry bulb and wet bulb temperatures
- C. The barometric pressure
- D. The engine temperature

Correct answer: B

**51.** At about GMT 1436, on 3 December, the lower limb of the Moon is observed with a sextant having an index error of 2.5' on the arc. The height of eye is 32 feet. The sextant altitude (hs) is 3°38.8'. What is the observed altitude?

- A. Ho 4°18.6'
- B. Ho 4°29.1'
- C. Ho 4°36.3'
- D. Ho 4°42.2'

Correct answer: B

**52.** What is NOT an advantage of the rhumb line track over a great circle track?

- A. Easily plotted on a Mercator chart
- B. Negligible increase in distance on east-west courses near the equator
- C. Does not require constant course changes
- D. Plots as a straight line on Lambert conformal charts

Correct answer: D

**53.** A sidereal day is shorter than a solar day. What is the reason for this difference?

- A. The precession of the equinoxes
- B. The use of different reference points
- C. The space motion of the solar system
- D. Irregularities in the daily rotational rate of the Sun

Correct answer: B

**54.** How does the standard magnetic compass heading differ from the true heading?

- A. By latitude
- B. By variation
- C. By compass error
- D. By deviation

Correct answer: C

**55.** Your ARPA has two guard zones. What is the purpose of the inner guard zone?

- A. Guard against target loss during critical maneuvering situations
- B. Alert the watch officer that a vessel is approaching the preset CPA limit
- C. Sound an alarm for targets first detected within the zone
- D. Warn of small targets that are initially detected closer than the outer guard zone

Correct answer: D

**56.** Which weather element cannot be measured accurately while on board a moving vessel?

- A. Visibility
- B. Wind direction
- C. Temperature
- D. Atmospheric pressure

Correct answer: A

**57.** At 0000 you fix your position and change course to 090°T. At 0030 you again fix your position, and it is 0.5 mile east of your DR. Which statement is TRUE?

- A. The drift is 0.5 knot.
- B. The current is easterly.
- C. You should alter course to the right to regain the track line.
- D. The current is perpendicular to your track line.

Correct answer: B

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

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

Correct answer: D

**59.** Which statement about a gnomonic chart is correct?

- A. Distance is measured at the mid-latitude of the track line.
- B. Meridians appear as curved lines converging toward the nearer pole.
- C. Parallels, except the equator, appear as curved lines.
- D. A rhumb line appears as a straight line.

Correct answer: C

**60.** Which item in illustration D034NG below shows a fixed and flashing light?

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

Correct answer: A

**61.** Chart information details to be used in ECDIS should be the latest edition of information originated by a government-authorized hydrographic office and conform to the standards of which organization?

- A. International Hydrographic Organization
- B. International Maritime Organization
- C. US Coast Guard
- D. NASA

Correct answer: A

**62.** Which clouds are described as 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?

- A. altocumulus
- B. cirrostratus
- C. altostratus
- D. cirrocumulus

Correct answer: C

**63.** Under the IALA-A Buoyage System, a buoy indicating the preferred channel is to port would have

\_\_\_\_\_.

- A. a pillar shape
- B. horizontal bands
- C. an even number
- D. an odd number

Correct answer: B

**64.** When compared to air temperature, which factor is most useful in predicting fog?

- A. Barometric pressure
- B. Absolute humidity
- C. Vapor pressure
- D. Dew point

Correct answer: D

**65.** Which theoretical minimum number of measurements from satellites does a GPS receiver need in order to provide an exact three-dimensional position?

- A. Five
- B. Four
- C. Three
- D. Two

Correct answer: B

**66.** You are steaming in the open ocean of the North Pacific between the Aleutian Chain and Hawaii. A warning broadcast indicates that an earthquake has occurred in the Aleutians and has generated a tsunami that is predicted to hit Hawaii. What action is necessary for the ship's safety?

- A. No special action as tsunamis are inconspicuous in the open ocean
- B. Securely stow all loose gear, check deck lashings, and prepare for extreme rolls.
- C. Prepare for sudden, high-velocity wind gusts from rapidly changing directions.
- D. Calculate the tsunami's ETA at your position and turn to a course that will head into the Tsunami.

Correct answer: A

67. You swung ship and compared the magnetic compass against the gyrocompass to find deviation. Gyro error is 2°W. The variation is 8°W. Find the deviation on a magnetic compass heading of 166°.

NP-0120	
HEADING	
PSC	PGC
030.5°	024°
061.5°	054°
092.0°	084°
122.5°	114°
152.0°	144°
181.0°	174°
239.5°	234°
269.0°	264°
210.0°	204°
298.0°	294°
327.5°	324°
358.5°	354°

- A. 2.0°W
- B. 1.5°W
- C. 1.0°W
- D. 0.5°W

Correct answer: B

68. Which type of daymark is used to mark the port side of the channel when entering from sea?

- A. Green square
- B. Black and white diamond
- C. Red and white octagon
- D. Red triangle

Correct answer: A

69. ECDIS units incorporate Digital Chart Data that utilizes which formats?

- A. Imposed viewing formats
- B. Both vector and raster formats
- C. Vector formats only
- D. Raster formats only

Correct answer: B

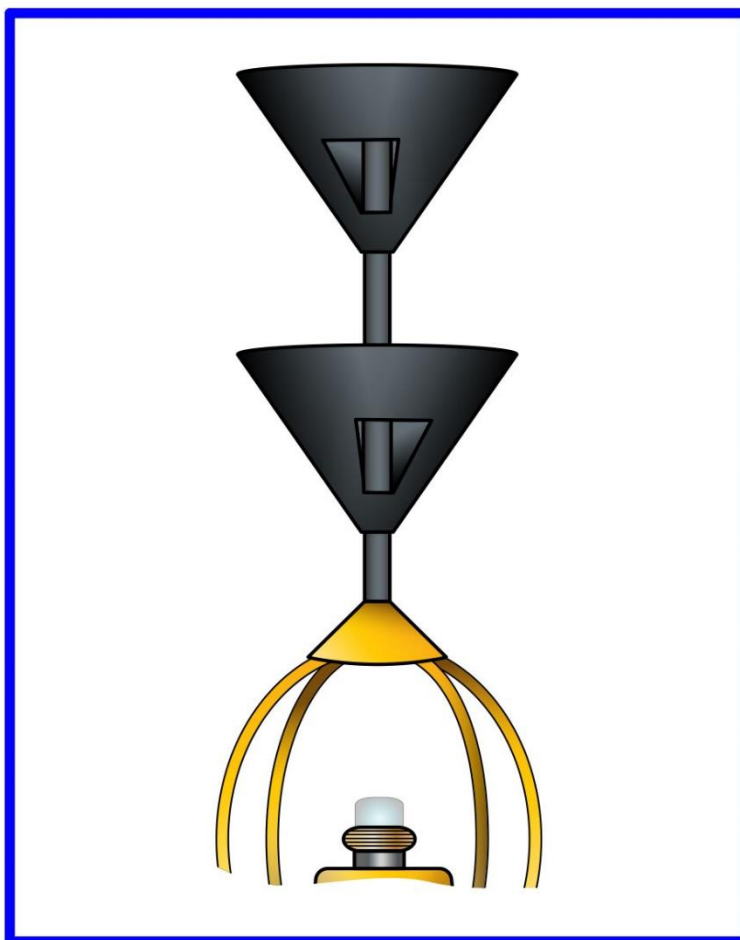
70. When does the effects of priming of the tides occur?

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

Correct answer: B



**D026NG**



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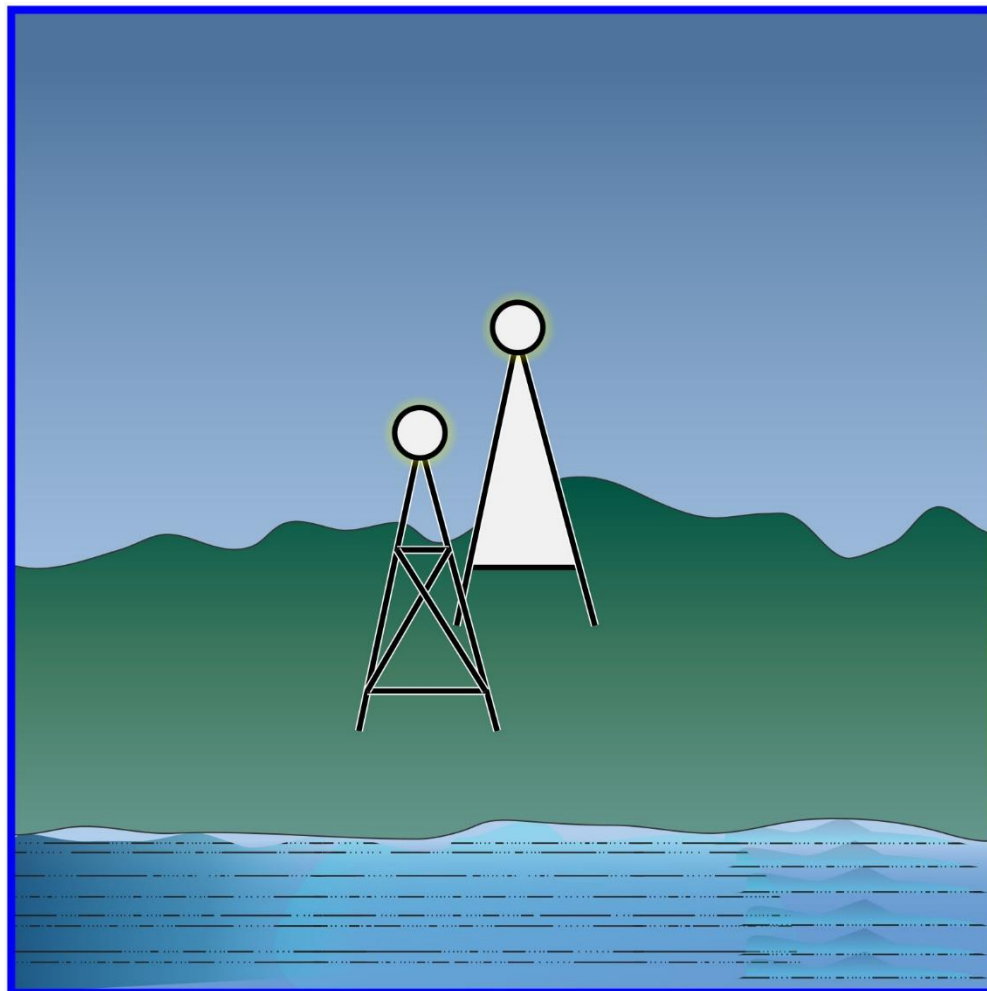
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