

U.S.C.G. Merchant Marine Exam
Master/Chief Mate of Unlimited Tonnage
Q105 Navigation General – Near Coastal
(Sample Examination)

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

1. 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. ionospheric skip waves
 - C. a submerged submarine
 - D. ducting

Correct answer: D

2. 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. 39 feet (11.9 meters)
 - B. 43 feet (13.1 meters)
 - C. 47 feet (14.3 meters)
 - D. 57 feet (17.4 meters)

Correct answer: A

3. What does the shoreline on charts generally represent?
- A. The mean low water line
 - B. The mean high water line
 - C. The mean low water spring line
 - D. The mean tide level

Correct answer: B

4. You take a bearing of 264° of a lighthouse. What bearing of another object would give the best fix?
- A. 120°
 - B. 081°
 - C. 289°
 - D. 350°

Correct answer: D

5. Which action is the safest and most prudent procedure to follow while navigating in the vicinity of a tropical cyclone?
- A. Batten down and prepare to ride out the storm
 - B. Continue to navigate farther from the coast
 - C. Take positive steps to avoid it if possible
 - D. Always navigate towards the coast by the most direct route

Correct answer: C

6. Which is TRUE of a dead reckoning (DR) plot?

- A. It is most useful when in sight of land
- B. It must be plotted using magnetic courses
- C. It may be started at an assumed position
- D. It ignores the effect of surface currents

Correct answer: D

7. You are sailing south on the Intracoastal Waterway (ICW) when you sight a red nun buoy with a yellow square painted on it. Which statement is TRUE?

- A. You should leave the buoy to port.
- B. ICW traffic should not proceed beyond the buoy unless the crossing waterway is clear of all traffic.
- C. The waterway in that area has shoaled and the available depth of water is less than the project depth.
- D. The buoy is off station and should be ignored as a navigational mark.

Correct answer: A

8. All straight lines represent great circle tracks on a chart based on which projection?

- A. Gnomonic projection
- B. Mercator projection
- C. Polyconic projection
- D. Orthographic projection

Correct answer: A

9. Which of the following are data layer categories to be displayed on ECDIS?

- A. Notice to Mariners information
- B. ECDIS warnings and messages
- C. Hydrographic Office data
- D. All of the above

Correct answer: D

10. If within 500 yards (460m) of a Northern Right Whale you are lawfully obligated to take which actions?

- A. Slow to bare steerageway until the whale swims away
- B. Stop the vessel and sound repeated blasts on the ship's whistle to scare the whale away
- C. Turn away from the whale and leave at slow speed
- D. Turn away from the whale and leave at full speed

Correct answer: C

11. What does the expression "the air is saturated" mean?

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

Correct answer: B

12. Which correction must be applied to an aneroid barometer reading?

- A. Height error
- B. Gravity error
- C. Temperature error
- D. English to metric conversion error

Correct answer: A

13. 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. furnish additional thrust in the form of a fair or following current
- C. set the vessel to the right
- D. set the vessel to the left

Correct answer: C

14. By convention, the north pole of a magnet is painted which color?

- A. White
- B. Blue
- C. Black
- D. Red

Correct answer: D

15. Weather observations provided by each weather station include all of the following except which item?

- A. Visibility
- B. Predicted weather for the next twelve hours
- C. Barometric pressure and change in the last three hours
- D. Temperature

Correct answer: B

16. What does a white buoy with a blue band signify?

- A. An isolated danger mark
- B. A mooring buoy
- C. Marking a restricted area
- D. A hydrographic data collection buoy

Correct answer: B

17. Which type of precipitation occurs only in thunderstorms with strong convection currents that convey raindrops above and below the freezing level?

- A. Sleet
- B. Freezing rain
- C. Hail
- D. Rime

Correct answer: C

18. When do the prevailing westerlies of the Southern Hemisphere blow 17-27 knots?

- A. During the winter only
- B. During spring only
- C. All year long
- D. During the summer months only

Correct answer: C

19. You are underway on course 059°T at a speed of 13.8 knots. You sight a light bearing 064°T at a radar range of 5.1 miles at 1839. If you change course at 1845, what is the course to steer to leave the light abeam to starboard at 1.0 mile?

- A. 047°T
- B. 050°T
- C. 053°T
- D. 058°T

Correct answer: B

20. Which would be the characteristic of an occulting light?

- A. 5 sec. flash, 5 sec. eclipse
- B. 4 sec. flash, 2 sec. eclipse, 3 sec. flash, 2 sec. eclipse
- C. 1 sec. flash, 2 sec. eclipse, 1 sec. flash, 5 sec. eclipse
- D. 6 sec. flash, 6 sec. eclipse

Correct answer: B

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

- A. At times of new and full Moon
- 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. When the Earth, Moon, and Sun are lying approximately on the same line

Correct answer: B

22. Which winds have the greatest effect on the set, drift, and depth of the equatorial currents?

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

Correct answer: A

23. After an item of required safety equipment on a towing vessel fails, the owner or Master must consider all of these factors before continuing the voyage, EXCEPT the _____.

- A. dictates of good seamanship
- B. safety of the vessel, considering the other traffic in the area
- C. weather conditions, including visibility
- D. estimated time of arrival promised to the customer

Correct answer: D

24. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships fog horn 2 seconds after the signal was sounded. What is the distance to the shore?
- A. 280 yards
 - B. 360 yards
 - C. 320 yards
 - D. 140 yards

Correct answer: B

25. Tropical cyclones normally form within which of the following belts of latitude?
- A. 15° to 30°
 - B. 45° to 60°
 - C. 30° to 45°
 - D. 5° to 15°

Correct answer: D

26. Which is TRUE why Tropical cyclones do not form within 5° of the Equator?
- A. Negligible Coriolis force in the region
 - B. There are no fronts in that area
 - C. The region is too humid
 - D. It is too hot in that region

Correct answer: A

27. 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 high and the amount of the error must be subtracted from the compass to obtain true
 - D. The readings are too low (small numerically) and the amount of the error must be added to the compass to obtain true

Correct answer: D

28. Under the IALA cardinal system, what does a mark with a quick white light showing 6 flashes followed by one long flash indicate in relation to the location of the safest water?
- A. Safe water is on the south side of the mark
 - B. Safe water is on the west side of the mark
 - C. Safe water is on the east side of the mark
 - D. Safe water is on the north side of the mark

Correct answer: A

29. The Brazil Current flows in which general direction?

- A. Southeasterly
- B. Northwesterly
- C. Northerly
- D. Southwesterly

Correct answer: D

30. When adjusting a magnetic compass for error, which is TRUE concerning the deviation table?

- A. Construct the deviation table after correcting for variation
- B. Construct the deviation table before the quadrantal correctors are placed on the compass
- C. Construct the table after adjusting the fore-and-aft permanent magnets
- D. Construct the deviation table before correcting for any deviation

Correct answer: C

31. You are on course $222^{\circ}T$ and take a relative bearing of a lighthouse of 025° . What is the true bearing to the lighthouse?

- A. 247°
- B. 335°
- C. 315°
- D. 197°

Correct answer: A

32. Which is TRUE of Radiation fog?

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

Correct answer: B

33. A pilot chart does NOT contain information about which item?

- A. Tidal currents
- B. Average wind conditions
- C. Average limits of field ice
- D. Magnetic variation

Correct answer: A

34. In the Northern Hemisphere, swells that have outrun the storm are produced in which location?

- A. In the rear of the left semicircle
- B. In the left front quadrant of the right semicircle
- C. In the right front quadrant of the right semicircle
- D. In the after section of the left semicircle

Correct answer: C

35. You wish to measure the distance on a Mercator chart between a point in latitude $43^{\circ}30'N$ and a point in latitude $40^{\circ}30'N$. To measure 30 miles at a time, where should you set the points of the dividers to obtain the most accurate measurement?
- A. $41^{\circ}30'$ and $42^{\circ}00'$
 - B. $41^{\circ}45'$ and $42^{\circ}15'$
 - C. $42^{\circ}00'$ and $42^{\circ}30'$
 - D. $42^{\circ}15'$ and $42^{\circ}45'$

Correct answer: B

36. Which publication indicates the HYDROLANTS or HYDROPACS issued since the previous working day?
- A. Local Notice to Mariners
 - B. Summary of Corrections
 - C. Broadcast Notice to Mariners
 - D. Daily Memorandum

Correct answer: D

37. Which is TRUE of a vertically-striped buoy?
- A. It may be lighted with a red light
 - B. It may be striped black and yellow
 - C. It may be striped black and green
 - D. It may be lighted with a white light

Correct answer: D

38. 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

39. What occurs when rising air cools to the dew point?
- A. Advection fog forms
 - B. Humidity decreases
 - C. Winds increase
 - D. Clouds form

Correct answer: D

40. What is the reference datum mean high water used to measure?
- A. Both heights and soundings worldwide
 - B. Heights of topographical features in the United States
 - C. Soundings on the east coast of the United States
 - D. Soundings in European waters

Correct answer: B

41. You are underway and pass by a lighthouse. Its light, which was white since you first sighted it, changes to red. What does this indicate?
- A. The light is characterized as alternately flashing
 - B. It is the identifying light characteristic of the lighthouse
 - C. That you have entered an area of shoal water or other hazard
 - D. The lighthouse has lost power and has switched to emergency lighting

Correct answer: C

42. Which piece of navigational safety equipment is NOT required on towing vessels over 12 meters in length, provided that the vessel remains within the navigable waters of the U.S.?
- A. Charts or maps of the areas to be transited
 - B. Searchlight
 - C. GPS receiver
 - D. VHF-FM radio(s)

Correct answer: C

43. Which meteorological feature controls the climate of the Gulf of Mexico and the coastal area during late spring and summer?
- A. The doldrums
 - B. The Bermuda High
 - C. The horse latitudes
 - D. Tropical cyclones

Correct answer: B

44. It is desirable that a vessel encountering hurricane or typhoon conditions sends weather reports to the closest meteorological service at which time interval?
- A. Every 6 hours
 - B. Every hour
 - C. Every 3 hours
 - D. Every 8 hours

Correct answer: C

45. In the North Sea area, you sight a buoy showing a quick white light showing 6 flashes followed by one long flash at 15 second intervals. Which of the four topmarks in illustration D031NG below would be fitted to this buoy?
- A. A
 - B. B
 - C. C
 - D. D

Correct answer: C

46. Which is a characteristic of anticyclones?

- A. High winds and cloudiness
- B. Gustiness and continuous precipitation
- C. Dry, fair weather
- D. Overcast skies

Correct answer: C

47. You swung ship and compared the magnetic compass against the gyrocompass to find deviation. Gyro error is 2°E. The variation is 8°W. Find the deviation on a magnetic compass heading of 057°.

NP-0109

HEADING	
PSC	PGC
030.5°	- 020°
061.5°	- 050°
092.0°	- 080°
122.5°	- 110°
152.0°	- 140°
181.0°	- 170°
210.0°	- 200°
239.5°	- 230°
269.0°	- 260°
298.0°	- 290°
327.5°	- 320°
358.5°	- 350°

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

Correct answer: C

48. Barometers are calibrated at which standard temperature?

- A. 0°F
- B. 32°F
- C. 60°F
- D. 70°F

Correct answer: B

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

Correct answer: D

50. What weather change accompanies the passage of a cold front in the Northern Hemisphere?
- A. Wind shift from northeast clockwise to southwest
 - B. Steady dropping of barometric pressure
 - C. Steady precipitation, gradually increasing in intensity
 - D. A line of cumulonimbus clouds

Correct answer: D

51. If you observe a rapid fall of barometric pressure, which action should you take?
- A. Contact the NWS or a local radio station
 - B. Know that the barometer is not working properly
 - C. Prepare for an onset of stormy weather with strong winds
 - D. Call the Coast Guard to verify the change

Correct answer: C

52. Which describes the visible range marked on charts for lights?
- A. The minimum distance at which the light may be seen with infinite visibility
 - B. The minimum distance at which the light may be seen based on a 12 mile distance to visible horizon
 - C. The maximum distance at which a light may be seen in clear weather with 10 miles visibility
 - D. The maximum distance the light may be seen restricted by the height of the light and the curvature of the earth

Correct answer: C

53. In the IALA Buoyage System, preferred-channel-to-port or preferred-channel-to-starboard buoys, which is TRUE when fitted with lights?
- A. The light shall be group flashing
 - B. The light must be a long flashing light
 - C. The light will be quick flashing light
 - D. The light must be a composite group flashing (2 + 1) light

Correct answer: D

54. Your vessel is proceeding down 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 $229^{\circ}T$, and variation is $6^{\circ}W$. If the heading of your vessel at the time of the sighting is 232° per standard magnetic compass, what is the deviation?

- A. $3^{\circ}E$
- B. $9^{\circ}E$
- C. $3^{\circ}W$
- D. $9^{\circ}W$

Correct answer: A

55. When should your dead reckoning position should be plotted?

- A. Whenever an estimated position is plotted
- B. When it agrees with your GPS position
- C. When coming on or going off soundings
- D. At least every hour on the hour in the open waters of the sea

Correct answer: D

56. Which of the listed properties does warm air possess?

- A. Moisture in warm air condenses as the air is heated
- B. It rises above cooler air and cools as it rises
- C. Atmospheric pressure rises as warm air rises
- D. Warm air that has cooled will develop low pressure areas

Correct answer: B

57. Which aid is NOT marked on a chart with a magenta circle?

- A. Radar transponder beacon
- B. Radio beacon
- C. Radar station
- D. Aero light

Correct answer: D

58. Which is the region containing $3/4$ of the mass of the atmosphere and to which are confined such phenomena as clouds, storms, precipitation and changing weather conditions?

- A. The stratosphere
- B. The tropopause
- C. The stratopause
- D. The troposphere

Correct answer: D

59. The left half of the storm is called the navigable semicircle because _____.

- A. the wind speed is decreased by the storm's forward motion
- B. the wind tends to blow vessels away from the storms track
- C. Both A and B
- D. Neither A nor B

Correct answer: C

60. An indirect radar echo is caused by a reflection of the main lobe of the radar beam off the observer's vessel. Which of the following is NOT a characteristic of indirect echoes?
- A. When plotted, their movements are usually abnormal.
 - B. They always appear on a bearing of 90° from the true bearing of the contact.
 - C. The indirect echoes usually appear in shadow sectors.
 - D. Their bearing is almost constant, even when the true bearing of the contact changes appreciably.

Correct answer: B

61. To make sure of getting the full advantage of a favorable current, you should reach an entrance or strait at which time in relation to the predicted time of the favorable current?
- A. At the predicted time
 - B. One hour after
 - C. 30 minutes before flood, one hour after an ebb
 - D. 30 minutes before

Correct answer: D

62. Which is TRUE concerning Spring tides?
- A. Spring Tides only occur in the spring of the year
 - B. Spring Tides have lows lower than normal and highs higher than normal
 - C. Spring Tides have lows higher than normal and highs lower than normal
 - D. Spring Tides are always unpredictable

Correct answer: B

63. You are steaming on a course of $253^\circ T$ at 14 knots. At 2329 you observe a lighthouse bearing $282^\circ T$. At 2345 the lighthouse bears $300^\circ T$. What is your distance off at the second bearing?
- A. 5.2 miles
 - B. 3.7 miles
 - C. 5.9 miles
 - D. 4.3 miles

Correct answer: C

64. Which is TRUE when using the radar for navigation?
- A. The best fix is obtained by using a tangent bearing and a range
 - B. When using ranges, the most rapidly changing range should be measured first
 - C. When crossing a radar range of one object with the visual bearing of a second object, the two objects should be 80° to 110° apart
 - D. When using two radar ranges for a fix, the objects of the ranges should be close to reciprocal bearings

Correct answer: B

65. 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

Correct answer: B

66. Yesterday your chronometer read 03h 01m 56s at the 1500 GMT time tick. Today your chronometer read 03h 01m 58s at the 1500 GMT time tick. What is the chronometer error?

- A. 01m 58s fast
- B. 03h 01m 58s fast
- C. -2s
- D. +2s

Correct answer: A

67. If the current and wind are in opposite directions, what does the sea surface indicate?

- A. The surface does not change, each cancels the other
- B. The surface indicates a greatly reduced wind speed
- C. The surface indicates a lower wind speed than what really exists
- D. The surface indicates a higher wind speed than what really exists

Correct answer: D

68. While steering a course of 150°T, you wish to observe the Sun for a speed check. What would the azimuth have to be?

- A. 240°T
- B. 150°T
- C. 090°T
- D. 060°T

Correct answer: B

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

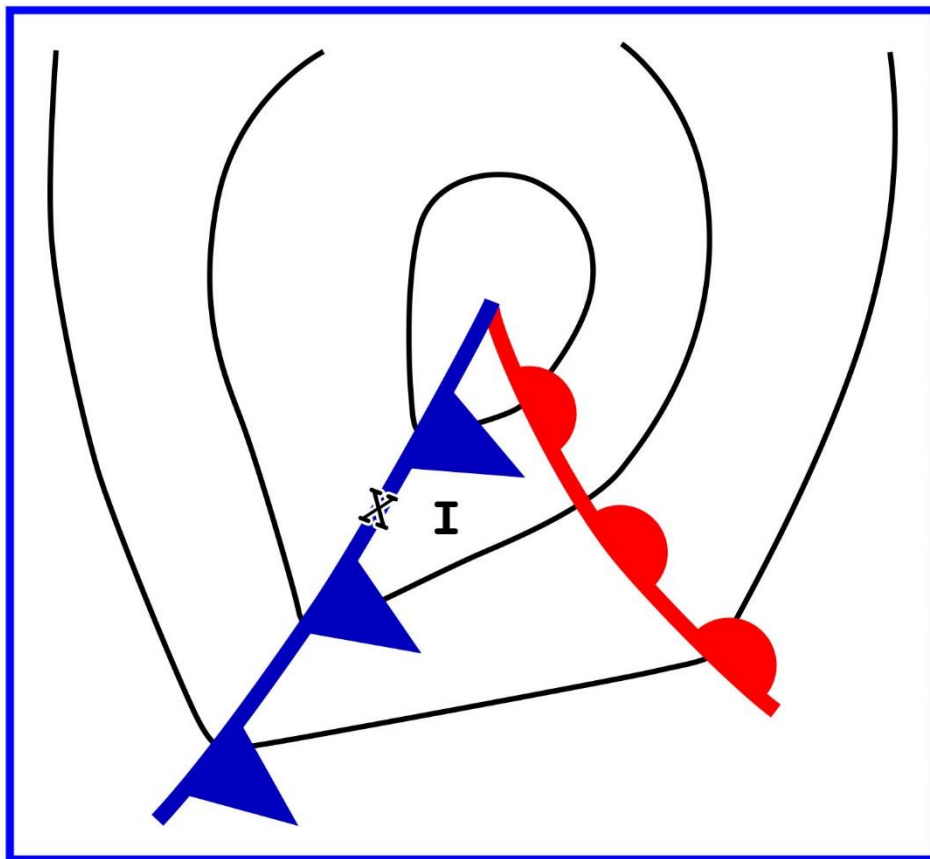
Correct answer: C

70. Your vessel is located at position I on the weather map in illustration D013NG below. You should experience which weather condition?

- A. Steady precipitation
- B. Clear skies with warm temperatures
- C. Thundershowers
- D. Overcast skies with rising temperature

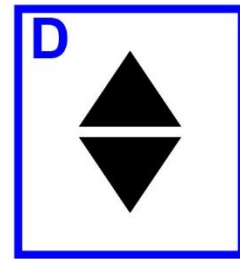
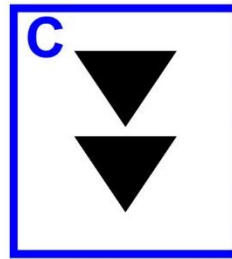
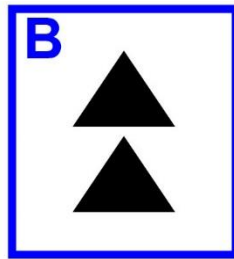
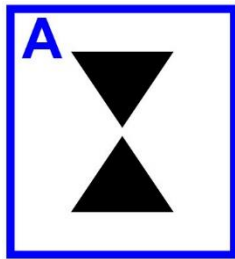
Correct answer: C

D013NG



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D031NG



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