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. In the North Sea area, you sight a buoy showing a quick white light with 9 flashes every 15 seconds. Which of the four topmarks shown in illustration D030NG below would be fitted to the buoy?
   - (A) A
   - (B) B
   - (C) C
   - (D) D

   If choice C is selected set score to 1.

2. 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.

3. When the Moon's declination is maximum north, which of the following will occur?
   - (A) Tropic tides
   - (B) Higher high tides and lower low tides
   - (C) Equatorial tides
   - (D) Mixed-type tides

   If choice A is selected set score to 1.

4. You are on course 222°T and take a relative bearing of a lighthouse of 025°. What is the true bearing to the lighthouse?
   - (A) 315°
   - (B) 197°
   - (C) 335°
   - (D) 247°

   If choice D is selected set score to 1.
5. Which radar control shortens all echoes on the display and reduces clutter caused by rain or snow?
   - (A) The brilliance control
   - (B) The sensitivity time control (sea clutter control)
   - (C) The fast time constant (differentiator)
   - (D) The receiver gain control

   If choice C is selected set score to 1.

6. Your vessel is enroute from Japan to Seattle and is located at position I on the weather map in illustration D013NG below. You should experience which weather condition?
   - (A) Overcast skies with rising temperature
   - (B) Clear skies with warm temperatures
   - (C) Thundershowers
   - (D) Steady precipitation

   If choice C is selected set score to 1.

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

   If choice C is selected set score to 1.

8. When drawing a weather map and an isobar crosses a front, the isobar is drawn __________.
   - (A) kinked and pointing away from the low
   - (B) kinked and pointing towards the low
   - (C) perpendicular to the front
   - (D) kinked and pointing towards the high for a warm front only

   If choice A is selected set score to 1.

9. Which measurement uses mean high water as the reference plane?
   - (A) Water depths on the East Coast only
   - (B) Heights above water of land features such as lights
   - (C) Soundings on the East and West Coasts
   - (D) All vertical measurements on charts

   If choice B is selected set score to 1.
10. Why is the wind velocity higher in the dangerous semicircle of a tropical cyclone?

- (A) The pressure gradient and forward motion of the storm
  - (B) The recurvature effect
  - (C) The direction of circulation and forward motion of the storm
  - (D) The extension of the low pressure ridge

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

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

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

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

12. If you are the Master of a towing vessel who's only working radar no longer functions, what must you do?

- (A) Moor the vessel until it is repaired.
  - (B) Notify the Officer in Charge of Marine Inspection (OCMI) if you cannot repair it within 48 hours.
  - (C) Notify the Captain of the Port (COTP) if you cannot repair it within 96 hours.
  - (D) Anchor the vessel until it is repaired.

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

13. Weather forecast messages are usually __________.

- (A) transmitted only by commercial broadcast stations
  - (B) given only to TV stations
  - (C) broadcast in plain language
  - (D) broadcast immediately on VHF Channel 16 and 2182 kHz

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

14. What will act to dissipate fog?

- (A) Downslope motion of an air mass along a coast
  - (B) Upwelling cold water
  - (C) Rain that is warmer than air
  - (D) Advection of warm air over a colder surface

*If choice A is selected set score to 1.*
15. Which is TRUE concerning Spring tides?
   - (A) Spring Tides have lows higher than normal and highs lower than normal
   - (B) Spring Tides have lows lower than normal and highs higher than normal
   - (C) Spring Tides are always unpredictable
   - (D) Spring Tides only occur in the spring of the year

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

16. 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) Spilling
   - (B) Converging
   - (C) Plunging
   - (D) Surging

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

17. Which type of cloud is among the most dependable for giving an indication of an approaching weather system?
   - (A) Nimbus
   - (B) Cumulus
   - (C) Altostratus
   - (D) Cumulostratus

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

18. Your vessel is steering course 243°psc. Variation for the area is 5°E, and deviation is 2°W. The wind is from the south-southeast, producing a 2° leeway. What true course are you making good?
   - (A) 242°T
   - (B) 244°T
   - (C) 246°T
   - (D) 248°T

   *If choice D is selected set score to 1.*
19. 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 143°.

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<th>HEADING</th>
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<td>327.5°</td>
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- (A) 2.0°W
- (B) 1.5°W
- (C) 0.5°W
- (D) 0.0°

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

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

- (A) Blue
- (B) Black
- (C) White
- (D) Red

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

21. Your vessel is on a course of 221°T at 15 knots. At 0319 a light bears 198.5°T, and at 0353 the light bears 176°T. At what time and distance off will your vessel be when abeam of the light?

- (A) 0427, 7.4 miles
- (B) 0410, 5.2 miles
- (C) 0417, 6.0 miles
- (D) 0407, 4.3 miles

*If choice C is selected set score to 1.*
22. You take a bearing of 086° of a lighthouse. What bearing of another object would give the best fix?

- (A) 000°
- (B) 066°
- (C) 112°
- (D) 271°

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

23. What does a white buoy with an open-faced orange diamond on it indicate?

- (A) Vessels are excluded from the area
- (B) Danger
- (C) Operating restrictions are in effect
- (D) The buoy is a mooring buoy

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

24. You are running parallel to the coast and plotting running fixes using bearings of the same object. You are making more speed than assumed for the running fix. In relation to the position indicated by the fix you will be __________.

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

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

25. What do chart legends printed in capital letters indicate about the associated landmark?

- (A) The landmark is conspicuous
- (B) The landmark has a radio transmitter
- (C) It is a government facility or station
- (D) The landmark is inconspicuous

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

26. Buoys are marked with reflective material to assist in their detection by searchlight. Which statement is TRUE?

- (A) A special-purpose mark will display either red or green reflective material to agree with its shape.
- (B) A preferred-channel buoy displays either red or green reflective material to agree with the top band of color.
- (C) A safe-water buoy will display red and white vertical stripes of reflective material.
- (D) All reflective material is white because it is the most visible at night.

*If choice B is selected set score to 1.*
27. By what means are indications of the master gyrocompass sent to remote repeaters?

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

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

28. Your ship is entering port from sea, and you sight a pair of range lights. When in line, they bear 315° per standard magnetic compass. The chart shows that the range bearing is 312°T, and that variation is 6°W. What is the deviation of your compass at the time of the sighting?

- (A) 3°E
- (B) 3°W
- (C) 9°E
- (D) 9°W

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

29. You are on course 238°T. To check the course of your vessel you should observe a celestial body on which bearing?

- (A) 180°
- (B) 238°
- (C) 328°
- (D) 090°

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

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

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

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

31. All of the following can be found on a Pilot Chart EXCEPT information concerning which item?

- (A) Amounts of precipitation
- (B) Sea surface temperatures
- (C) Percentage of frequency of wave heights
- (D) Percentage of poor visibility conditions

*If choice A is selected set score to 1.*
32. The climate of the northern coast of the Gulf of Mexico is _________.
   - (A) is humid and subtropical throughout the year
   - (B) varies from warm to subtropical
   - (C) is a warm marine type of climate
   - (D) has an east coast marine type of climate

   If choice C is selected set score to 1.

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

   If choice A is selected set score to 1.

34. You are on course 209°T. In order to check the longitude of your vessel, you should observe a celestial body on which bearing?
   - (A) 209°
   - (B) 270°
   - (C) 299°
   - (D) 000°

   If choice B is selected set score to 1.

35. An air mass that has moved down from Canada would most likely have which symbols?
   - (A) cPk
   - (B) cTk
   - (C) mTk
   - (D) cTw

   If choice A is selected set score to 1.

36. 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) Any error will remain constant unless the compass is stopped and restarted.
   - (C) Any error shown by a gyro repeater will be the same as the error of the master compass.
   - (D) The amount of the error and the sign will generally be the same on all headings.

   If choice D is selected set score to 1.
37. How long would a steady wind need to blow in order to create a wind driven current?

- (A) 2 hours
- (B) 6 hours
- (C) 12 hours
- (D) 18 hours

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

38. 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)

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

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

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

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

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

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

41. During the winter months, which is TRUE of the southeast trade winds?

- (A) The Southeast Trade winds are wetter than during the summer months
- (B) The Southeast Trade winds are stronger than during the summer months
- (C) The Southeast Trade winds are drier than during the summer months
- (D) The Southeast Trade winds are weaker than during the summer months

*If choice B is selected set score to 1.*
42. The velocity of a rotary tidal current will be decreased when the Moon is at which phase?

- (A) Apogee
- (B) Perigee
- (C) Full
- (D) New

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

43. Which wind pattern has the most influence over the movement of frontal weather systems over the North American continent?

- (A) Dominant southwesterly flow
- (B) Northeast trades
- (C) Prevailing westerlies
- (D) Subpolar easterlies

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

44. Which is TRUE of an occulting light?

- (A) There is only a partial eclipse of the light
- (B) The period of light exceeds the period of darkness
- (C) The periods of light and darkness are equal
- (D) The period of darkness exceeds the period of light

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

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

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

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

46. Which can you use to indicate the bearing of the center of a hurricane or tropical storm?

- (A) The direction of movement of thunderstorms on radar
- (B) The point of origin of the altostratus clouds
- (C) The point of convergence of the cirrus clouds
- (D) The darkest point of the clouds in the "bar" of the storm

*If choice C is selected set score to 1.*
47. 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 east side of the mark
- (C) Safe water is on the west side of the mark
- (D) Safe water is on the north side of the mark

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

48. You are enroute from Puerto Rico to New York. A hurricane makes up and is approaching. What does it indicate if the wind veers steadily?

- (A) The vessel is directly in the path of the storm
- (B) The vessel is in the storm center
- (C) The vessel is in the navigable semicircle
- (D) The vessel is in the dangerous semicircle

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

49. If the current and wind are in the same direction, what does the sea surface represent concern the true wind speed?

- (A) It appears higher than actually exists
- (B) The appearance of the sea surface does not change
- (C) It appears less than actually exists
- (D) It appears at the correct speed

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

50. Which statement is TRUE concerning a Mercator projection?

- (A) The length of the meridians is increased to provide for equal expansion in all directions.
- (B) The mileage between the meridians is increased as the latitude increases.
- (C) Degrees of longitude decrease in length as latitude increases.
- (D) The length of the meridians remains constant at all latitudes

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

51. What weather change accompanies the passage of a cold front in the Northern Hemisphere?

- (A) Steady precipitation, gradually increasing in intensity
- (B) Wind shift from northeast clockwise to southwest
- (C) Steady dropping of barometric pressure
- (D) A line of cumulonimbus clouds

*If choice D is selected set score to 1.*
52. Which term describes a light, feathery deposit of ice by sublimation of water vapor directly into the crystalline form on objects whose temperatures are below freezing?

- (A) Dew
- (B) Frost
- (C) Snow
- (D) Glaze

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

53. You are enroute to assist vessel A. Vessel A is underway at 6 knots on course 133°T, and bears 042°T, 105 miles from you. What is the time to intercept if you make 10 knots?

- (A) 12h 30m
- (B) 12h 44m
- (C) 12h 58m
- (D) 13h 22m

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

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

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

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

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

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

56. The navigable semicircle of a tropical storm in the South Indian Ocean is located on which side of the storm’s track?

- (A) Rear
- (B) Front
- (C) Left
- (D) Right

*If choice D is selected set score to 1.*
57. All straight lines represent great circle tracks on a chart based on which projection?

- (A) Gnomonic projection
- (B) Orthographic projection
- (C) Mercator projection
- (D) Polyconic projection

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

58. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's fog horn 4 seconds after the signal was sounded. What is the distance to the shore?

- (A) 209 yards
- (B) 363 yards
- (C) 480 yards
- (D) 730 yards

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

59. 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 -.7 and +.5 feet
- (B) 1.2 feet
- (C) 4.1 feet
- (D) between 1.9 and 3.2 feet

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

60. If a sound signal is emitted from the oscillator of a fathometer, and two seconds elapse before the returning signal is picked up, what depth of water is indicated?

- (A) 1648 fathoms
- (B) 824 fathoms
- (C) 1248 fathoms
- (D) 1048 fathoms

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

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

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

*If choice B is selected set score to 1.*
62. Entering from sea, how would a daymark on the port side of the channel be indicated on a chart?

- (A) A green square with the letter G
- (B) A white square with the letters GR
- (C) A red triangle with the letter R
- (D) A white triangle with the letters RG

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

63. Which is TRUE as the temperature of an air mass decreases?

- (A) The absolute humidity decreases
- (B) The relative humidity increases
- (C) The dew point rises
- (D) The specific humidity decreases

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

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

- (A) AIS can be used to make passing arrangements via ship-to-ship text messaging but a vessel operator is not relieved from the requirement to sound whistle signals or make arrangements via bridge-to-bridge radiotelephone.
- (B) AIS cannot be used to make passing arrangements because the ship-to-ship text messaging feature is for emergency use only.
- (C) AIS can be used to make passing arrangements via ship-to-ship text messaging relieving a vessel operator from making such arrangements via bridge-to-bridge radiotelephone or signaling intent to pass via whistle signals.
- (D) AIS cannot be used to make passing arrangements because the system is not capable of this type of ship-to-ship communications.

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

65. 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) +2s
- (B) -2s
- (C) 01m 58s fast
- (D) 03h 01m 58s fast

*If choice C is selected set score to 1.*
66. Which meteorological feature controls the climate of the Gulf of Mexico and the coastal area during late spring and summer?

- (A) The Bermuda High
  - (B) The horse latitudes
  - (C) The doldrums
  - (D) Tropical cyclones

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

67. What does a slow rise in the barometric pressure forecast?

- (A) Improving weather conditions
  - (B) Rainy weather for the next 48 hours
  - (C) Deteriorating weather conditions
  - (D) High seas

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

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

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

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

69. Which item in Illustration D034NG below shows a flashing light?

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

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

70. When a buoy is in position only during a certain period of the year, where may the dates when the buoy is in position be found?

- (A) On the chart
- (B) Notice to Mariners
- (C) Coast Pilot
- (D) Light List

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