U.S.C.G. Merchant Marine Exam

Mate Less than 500-1600 Gross Registered Tons

Q139 Navigation General – Oceans

(Sample Examination)
Choose the best answer to the following Multiple Choice questions.

1. Which type of weather could you expect soon after seeing "hook" or "comma" shaped cirrus clouds?
   - (A) Rain with the approach of a warm front
   - (B) Continuing fog and rain
   - (C) Clearing with the approach of a cold front
   - (D) The formation of a tropical depression

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

2. Your vessel is participating in the Voluntary Observing Ship Program. You are preparing WS Form B-80 as seen in illustration D041NG below. Three-quarters of the sky is covered with clouds, and the anemometer indicates that the apparent wind is from 226° relative at 17.7 knots. You are on course 020°T at 8 knots. How should you encode group Nddff?
   - (A) 72218
   - (B) 72318
   - (C) 80208
   - (D) 62324

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

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

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

4. Information markers, when lighted, will display which color light?
   - (A) Yellow lights
   - (B) Red lights
   - (C) Green lights
   - (D) White lights

   *If choice D is selected set score to 1.*
5. A List of Lights entry (L Fl) is a single flashing light which shows a long flash of not less than which duration?
   - (A) 1.0 second duration
   - (B) 1.5 seconds duration
   - (C) 2.0 seconds duration
   - (D) 3.0 seconds duration

   If choice C is selected set score to 1.

6. What is a lighted safe water mark fitted with to aid in its identification?
   - (A) A red and white octagon
   - (B) A sequential number
   - (C) A spherical topmark
   - (D) Red and white retroreflective material

   If choice C is selected set score to 1.

7. The apparent wind's speed can be zero, but only when two conditions are present. One condition is that the true __________.
   - (A) wind must be from dead ahead
   - (B) wind's speed equals the ship's speed
   - (C) wind's speed must be zero
   - (D) wind must be on the beam

   If choice B is selected set score to 1.

8. What kind of pressure systems travel in tropical waves?
   - (A) Terrastatic pressure
   - (B) Low pressure
   - (C) Subsurface pressure
   - (D) High pressure

   If choice B is selected set score to 1.

9. Which condition(s) is(are) necessary for the formation of dew?
   - (A) Available nuclei in the air
   - (B) A surface warmer than the dew point of the air
   - (C) Moderate winds
   - (D) Clear skies

   If choice D is selected set score to 1.
10. If an observer in the Northern Hemisphere faces the surface wind, where is the center of low pressure located?
   - (A) To the right, and slightly behind
   - (B) To the left, and slightly in front

   If choice A is selected set score to 1.

11. Under the IALA-A Buoyage system, a buoy marking the starboard side of the channel when approaching from seaward may have which feature?
   - (A) A red light
   - (B) A triangular topmark
   - (C) A can shape
   - (D) An isophase light

   If choice B is selected set score to 1.

12. The greater the pressure difference between a high and a low pressure center, the __________.
   - (A) dryer the air mass will be
   - (B) cooler the temperature will be
   - (C) greater the force of the wind will be
   - (D) warmer the temperature will be

   If choice C is selected set score to 1.

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

   If choice C is selected set score to 1.

14. In modern fathometers, what produces the sonic or ultrasonic sound waves?
   - (A) An amplifier
   - (B) A transducer
   - (C) A generator
   - (D) A transceiver

   If choice B is selected set score to 1.
15. You are underway on course 050°T and your maximum speed is 10 knots. The eye of a hurricane bears 100°T, 90 miles from your position. The hurricane is moving towards 285°T at 19 knots. If you maneuver at 10 knots to avoid the hurricane, what could be the maximum CPA?

- (A) 39 miles
- (B) 45 miles
- (C) 53 miles
- (D) 59 miles

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

16. The Light List indicates that a dayboard is a type TR-SY. Which action should you take?

- (A) Look for a dayboard of type TR-TY to form a range
- (B) Expect a daymark with no lateral significance
- (C) Leave it to port when southbound on the Atlantic portions of the ICW
- (D) Pass it close aboard on either side

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

17. The tropical year differs from which year by 20 minutes?

- (A) Astronomical year
- (B) Sidereal year
- (C) Equinoctial year
- (D) Natural year

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

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

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

19. What type of clouds are associated with a cold front?

- (A) Cirrus and cirrostratus
- (B) Altostratus and fracto-cumulus
- (C) Altostratus and cirrus
- (D) Cumulus and cumulonimbus

*If choice D is selected set score to 1.*
20. The owner or Master of a towing vessel that is operating within a Vessel Traffic Service (VTS) area must report specific information to the service. Which of the following choices is not required to be reported?

- (A) Any malfunction of propulsion machinery, steering gear, radar, gyrocompass or depth-sounder, if installed
- (B) The type of credential he/she holds and its serial number
- (C) A shortage of personnel, lack of charts, maps or other required publications
- (D) Any characteristics of the vessel that affect its maneuverability

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

21. A chart has extensive corrections to be made to it. When these are made and the chart is again printed, what term is given to this chart issue?

- (A) Revised edition
- (B) First edition
- (C) New edition
- (D) Reprint

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

22. The largest waves (heaviest chop) will usually develop where the wind blows __________.

- (A) over slack water
- (B) at right angles to the flow of the current
- (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.*

23. Under the IALA-B Buoyage System, when entering from seaward which lateral system buoy as shown in illustration D046NG below, should be left to port?

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

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

24. Which of the Nautical Texts is/are published by the U.S. Coast Guard?

- (A) U.S. Coast Pilots
- (B) Light Lists
- (C) Radio Navigational Aids
- (D) All of the above

*If choice B is selected set score to 1.*
25. On which of the following does an automatic identification system (AIS) transponder transmit and receive information?

   - (A) UHF L-band
   - (B) 3 cm, X-band radar
   - (C) 10 cm, S-band radar
   - (D) VHF maritime band

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

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

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

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

27. The needle of an aneroid barometer points to 30.05 on the dial. What does this indicate?

   - (A) 30.05 inches of mercury
   - (B) 30.05 millibars
   - (C) 30.05 millimeters of mercury
   - (D) The barometric pressure is falling

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

28. What causes compass deviation?

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

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

29. Which publication contains information on Naval Cooperation and Guidance for Shipping (NCAGS) in time of emergency or war?

   - (A) Pub. 117, Radio Navigational Aids
   - (B) Pub. 102, International Code of Signals
   - (C) Appropriate volume of the Sailing Directions
   - (D) Light List

   *If choice A is selected set score to 1.*
30. Which information is NOT required to be posted in or near the wheelhouse?
   - (A) Stopping time and distance from full speed while maintaining course with minimum rudder
   - (B) A diagram of advance and transfer for turns of 30°, 60°, 90° and 120° at full speed with maximum rudder and constant power
   - (C) Operating instructions for change-over procedures for remote steering gear systems
   - (D) For vessels with a fixed propeller, a table of shaft RPMs for a representative range of speeds

   If choice B is selected set score to 1.

31. In the IALA Maritime Buoyage System, what is a red and white vertically-striped buoy used to indicate?
   - (A) Preferred channel
   - (B) A special mark not primarily used for navigation
   - (C) Isolated danger
   - (D) Safe water

   If choice D is selected set score to 1.

32. As a high pressure system approaches, which is TRUE concerning the barometer reading?
   - (A) The reading falls
   - (B) The reading falls rapidly
   - (C) The reading stays the same
   - (D) The reading rises

   If choice D is selected set score to 1.

33. You have determined that you are in the right semicircle of a tropical cyclone in the Northern Hemisphere. What action should you take to avoid the storm?
   - (A) Place the wind on the starboard bow and hold that course.
   - (B) Place the wind on the starboard quarter and hold that course.
   - (C) Place the wind on the port quarter and hold that course.
   - (D) Place the wind on the port bow and hold that course.

   If choice A is selected set score to 1.

34. The climate of the eastern coast of the Gulf of Mexico __________.
   - (A) has an east coast marine type of climate
   - (B) has a Mediterranean type of climate
   - (C) varies from warm to subtropical
   - (D) is humid and subtropical throughout the year

   If choice C is selected set score to 1.
35. Your vessel is on a course of 207°T at 13 knots.

At 0539 a light bears 180.5°T, and at 0620 the light bears 162°T.

At what time and at what distance off will your vessel be when abeam of the light?

- (A) 0701, 8.9 miles
- (B) 0641, 6.5 miles
- (C) 0633, 5.9 miles
- (D) 0653, 7.6 miles

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

36. You are inbound in a channel marked by a range. The range line is 309°T. You are steering 306°T and have the range in sight as shown in illustration D047NG below. The range continues to open. What action should you take?

- (A) Alter course to the right to 309°T or more to bring the range in line.
- (B) Maintain course as it is normal for the range to open as you get close.
- (C) Alter course to the left to close the range, then alter course to 309°T.
- (D) Alter course to the left until the range closes, then steer to the left of 306°T.

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

37. Which part of a sextant is mounted directly over the pivot of the index arm?

- (A) The index mirror
- (B) The horizon glass
- (C) The micrometer drum
- (D) The telescope

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

38. Which information does the outer ring of a compass rose on a nautical chart provide?

- (A) Annual rate of variation change
- (B) Variation
- (C) True directions
- (D) Magnetic directions

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

39. Which agency maintains federal aids to navigation?

- (A) Coast Guard
- (B) Corps of Engineers
- (C) Maritime Administration
- (D) National Ocean Service

*If choice A is selected set score to 1.*
40. In the horizon system of coordinates what is equivalent to the poles on the Earth?
   - (A) Nodes
   - (B) Ecliptic poles
   - (C) Celestial poles
   - (D) Zenith, nadir

   If choice D is selected set score to 1.

41. A sidereal day is shorter than a solar day. What is the reason for this difference?
   - (A) Irregularities in the daily rotational rate of the Sun
   - (B) The space motion of the solar system
   - (C) The precession of the equinoxes
   - (D) The use of different reference points

   If choice D is selected set score to 1.

42. How often are the time signals broadcast by WWV and WWVH transmitted?
   - (A) They are transmitted continuously throughout day
   - (B) They are transmitted every 15 minutes
   - (C) They are transmitted every hour
   - (D) They are transmitted every 30 minutes

   If choice A is selected set score to 1.

43. Which instrument is designed to maintain a continuous record of atmospheric pressure?
   - (A) A thermograph
   - (B) An aneroid barometer
   - (C) A barograph
   - (D) A mercurial barometer

   If choice C is selected set score to 1.

44. When within 300 miles of a named tropical storm or hurricane, it is standard practice to send weather reports at which time interval?
   - (A) Every 8 hours
   - (B) Every 3 hours
   - (C) Every hour
   - (D) Every 6 hours

   If choice B is selected set score to 1.
45. Fog is formed when which condition exists?
   - (A) The clouds are middle altitude
   - (B) When there is moisture in the air
   - (C) When air is cooled to its dew point
   - (D) When the land is cooled to its dew point

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

46. What is the approximate wavelength of an X Band Radar operating on a frequency of approximately 9.5 GHz?
   - (A) 3 cm
   - (B) 10 cm
   - (C) 30 cm
   - (D) 100 cm

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

47. Which is TRUE of a sea breeze?
   - (A) A wind that blows towards the sea at night
   - (B) A wind that blows towards an island during the day
   - (C) A wind caused by the distant approach of a hurricane
   - (D) A wind caused by cold air descending a coastal incline

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

48. You are inbound in a channel marked by a range. The range line is 133° T. You are steering 129° T and have the range in sight as shown in illustration D048NG below. Which action should you take?
   - (A) Immediately alter course to the right to bring the range in line.
   - (B) Immediately alter course to the left to bring the range in line.
   - (C) Continue on the present heading until the range is in line then alter course to the right.
   - (D) Immediately alter course to 133° T if the range is closing.

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

49. The difference between local apparent time (LAT) and local mean time (LMT) is indicated by the __________.
   - (A) equation of time
   - (B) longitude in time units
   - (C) zone description
   - (D) difference of longitude between the local and central meridian in time units

   *If choice A is selected set score to 1.*
50. The dry bulb temperature is 58\degree F (14.4\degree C) and the wet bulb temperature is 44\degree F (6.7\degree C). What is the relative humidity?

- (A) 25%
- (B) 28%
- (C) 30%
- (D) 58%

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

51. While proceeding along the Mediterranean coast of Spain, you sight the black and yellow buoy shown in illustration D020NG below. Your course is 039\degree T, and the buoy bears 053\degree T. What action should you take?

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

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

52. What must change for the compass deviation to change?

- (A) The heading of the vessel
- (B) The speed of the vessel
- (C) The geographical position of the vessel
- (D) The longitude of the vessel

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

53. In shallow water, waves that are too steep to be stable, causing the crests to move forward faster than the rest of the wave. This occurrence describes which term?

- (A) White caps
- (B) Rollers
- (C) Breakers
- (D) Surfers

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

54. A position on the Earth has a longitude of 74\degree 10'E. What would its celestial counterpart?

- (A) GHA of 285\degree50' 
- (B) LHA of 74\degree10'E 
- (C) SHA of 74\degree10' 
- (D) SHA of 285\degree50'

*If choice A is selected set score to 1.*
55. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's fog horn 3 seconds after the signal was sounded. What is the distance to the shore?

- (A) 1100 yards
- (B) 550 yards
- (C) 792 yards
- (D) 872 yards

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

56. What is the name given to lines on a chart which connect points of equal magnetic variation?

- (A) Isogonic lines
- (B) Magnetic declinations
- (C) Magnetic latitudes
- (D) Dip lines

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

57. Which best defines the height of tide?

- (A) The difference between the depth of the water at high tide and the depth of the water at low tide
- (B) The difference between the depth of the water and the area's tidal datum
- (C) The difference between the depth of the water and the high water tidal level
- (D) The depth of water at a specific time due to tidal effect

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

58. Which term defines the distance in miles between the circle of equal altitude for the observed altitude (Ho) and the circle of equal altitude for the computed altitude (Hc)?

- (A) Zenith angle
- (B) Zenith distance
- (C) Intercept
- (D) Equation of time

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

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

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

*If choice A is selected set score to 1.*
60. Under the IALA-A Buoyage System, a green spar buoy with a triangular topmark would indicate that the buoy __________.
   - (A) should be left to port when heading out to sea
   - (B) is on the north side of a point of interest
   - (C) is marking the preferred channel
   - (D) may be left close aboard on either side

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

61. Which is a characteristic of warm air masses?
   - (A) Turbulence within the mass
   - (B) Heavy precipitation
   - (C) Good visibility
   - (D) Stratiform clouds

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

62. The revision date of a chart is printed on which area of the chart?
   - (A) Lower left corner
   - (B) Part of the chart title
   - (C) Top center
   - (D) Any clear area around the neat line

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

63. The four standard light colors used for lighted aids to navigation are red, green, white, and __________.
   - (A) blue
   - (B) orange
   - (C) yellow
   - (D) purple

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

64. When recording the wind direction in the weather log, which information would you report?
   - (A) The duration of the maximum gust of wind
   - (B) The direction the wind is blowing toward
   - (C) The direction the wind is blowing from
   - (D) The wind chill factor

   *If choice C is selected set score to 1.*
65. Which of the following is a characteristic of a lighted cardinal mark?

- (A) Very quick flashing
- (B) Fixed
- (C) Flashing
- (D) Occulting

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

66. 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.*

67. A Doppler log in the volume reverberation mode indicates __________.

- (A) the depth of the water
- (B) the set of the current
- (C) speed through the water
- (D) speed being made good

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

68. When is the rhumb line distance the same as the great circle distance?

- (A) Course 045° T in low latitudes
- (B) Course 090° T in high latitudes
- (C) The rhumb line distance is always longer than the great circle distance.
- (D) Course 180° T when you cross the equator

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

69. Which are the two most effective generating forces of surface ocean currents?

- (A) Temperature and salinity differences in the water
- (B) Wind and density differences in the water
- (C) Rotation of the Earth and continental interference
- (D) Water depth and underwater topography

*If choice B 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 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

*If choice D is selected set score to 1.*
WEATHER REPORT FOR IMMEDIATE TRANSMISSION

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**ADDRESSES**

U.S. Coast Guard: No address needed, start with BBXX indicator and ship's call sign.

**INMARSAT**

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.

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 (get address from "Radio Stations Accepting, . . . ."). Start with BBXX indicator and ship’s call sign and combine the remaining numbers into 10-character groups.

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