

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 term is given to the angle that is measured westward from the first point of Aries to the hour circle of the body along the celestial equator?
- A. Azimuth angle
 - B. Greenwich sidereal angle
 - C. Sidereal hour angle
 - D. Local sidereal time

Correct answer: C

2. Which condition indicates that you are in a hurricane's dangerous semicircle in the Northern hemisphere?
- A. A norther
 - B. A backing wind
 - C. A veering wind
 - D. A strong, gusty wind

Correct answer: C

3. Your radar displays your ship off center. As you proceed on your course, your ship's marker moves on the PPI scope while echoes from land masses remain stationary. What is this display called?
- A. True motion
 - B. Stabilized
 - C. Off center
 - D. Head up

Correct answer: A

4. ECDIS must give an alarm for which of the following cases?
- A. If the ship, within a specified time set by the watch officer, is going to cross the boundary of a prohibited area
 - B. When the specified limit for deviation from the planned route is exceeded
 - C. If the ship, within a specified time set by the watch officer, is going to cross a safety contour
 - D. All of the above

Correct answer: D

5. The compass rose on a nautical chart indicates both variation and which other information?
- A. Deviation
 - B. Compass error
 - C. Annual rate of variation change
 - D. Annual rate of precession change

Correct answer: C

6. When trying to sight a lighthouse you notice a glare from a town in the background. How does this affect the range at which the light may be sighted?
- A. Increased if the light is red or green due to contrast with the glare
 - B. Increased slightly due to extra lighting
 - C. Considerably reduced and difficult to distinguish
 - D. Unchanged

Correct answer: C

7. Aneroid barometers are usually calibrated to indicate atmospheric pressure in which units?
- A. Inches of mercury and centimeters
 - B. Inches of mercury and millibars
 - C. Inches of mercury and millimeters
 - D. Feet of mercury and millibars

Correct answer: B

8. Considering the general circulation of the atmosphere, what is the name given to the wind system between latitudes 30°N and 60°N?
- A. Trade winds
 - B. Prevailing Westerlies
 - C. Southeasterlies
 - D. Northeast Trades

Correct answer: B

9. You are in a buoyed channel at night and pass a lighted buoy with an irregular characteristic. Who should you report this to?
- A. The Corps of Engineers
 - B. The Coast Guard
 - C. The harbor master
 - D. The National Ocean Service

Correct answer: B

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

Correct answer: B

11. 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. At or near transit
 - C. High in the sky
 - D. Near the horizon

Correct answer: D

- 12.** While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's foghorn 3 seconds after the signal was sounded. What is the distance to the shore?
- A. 550 yards
 - B. 872 yards
 - C. 792 yards
 - D. 1100 yards

Correct answer: A

- 13.** The owner or Master of a towing vessel shall ensure that each person that directs and controls the movement of the vessel can accomplish all of the following EXCEPT _____.
- A. evaluate the danger of each closing visual or radar contact
 - B. enter all required test and inspection results in the vessel's log or other record carried on board
 - C. reduce speed only where local speed limits are posted
 - D. adjust speed with due regard for the weather and visibility

Correct answer: C

- 14.** The shoreline shown on nautical charts of areas affected by large tidal fluctuations is usually the line of mean _____.
- A. lower low water
 - B. tide level
 - C. low water
 - D. high water

Correct answer: D

- 15.** Which is one of the advantages of a vessel utilizing a NAVTEX unit to receive MSI?
- A. Only an ordinary FM radio is necessary to receive these warnings
 - B. They cover a broad spectrum of the radio band allowing reception on almost any type of receiver
 - C. Information on a given topic is only broadcast at specified times
 - D. Ease of operation, knowledge of Morse code is not required

Correct answer: D

- 16.** Which wind results from a land mass cooling more quickly at night than an adjacent water area?
- A. Land breeze
 - B. Sea breeze
 - C. Mistral
 - D. Coastal breeze

Correct answer: A

17. To find the specific phase characteristic of a lighthouse on a sound of the United States you would use which reference?

- A. U.S. Coast Pilot
- B. Nautical Chart Catalog
- C. Light List
- D. American Practical Navigator

Correct answer: C

18. While on a course of 066°pgc , a light bears 13° on the port bow at a distance of 12.3 miles. What course should you steer to pass 4 miles abeam of the light leaving it to port?

- A. 079°pgc
- B. 067°pgc
- C. 072°pgc
- D. 085°pgc

Correct answer: C

19. A chart position enclosed by a square is a(n) _____.

- A. dead reckoning position
- B. fix
- C. estimated position
- D. running fix

Correct answer: C

20. Yesterday your chronometer read 02h 59m 58s at the 1500 GMT time tick. Today the chronometer reads 03h 00m 02s at the 1500 GMT time tick. What is the chronometer error?

- A. 02s fast
- B. +3s
- C. 03h 00m 02s fast
- D. -3s

Correct answer: A

21. 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

Correct answer: C

22. Which cardinal quadrant is represented by the topmark in illustration D024NG below?

- A. Northern
- B. Eastern
- C. Western
- D. Southern

Correct answer: C

23. Which is TRUE concern the horizon glass of a sextant?

- A. It is silvered on its half nearer the frame
- B. It is mounted on the index arm
- C. It is between the horizon and the shade glasses
- D. It is a movable bar the same material as the frame

Correct answer: A

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

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

Correct answer: D

25. You are steaming in a westerly direction along the Gulf Coast. You see ahead of you a lighted buoy showing a red isophase light. Which action should you take?

- A. Alter course and leave the buoy nearby on either side.
- B. Alter course to starboard and leave the buoy to port.
- C. Alter course and pass the buoy well off on either side.
- D. Alter course to port and leave the buoy to starboard.

Correct answer: D

26. On November 1st the zone time is 1700 EST (ZD +5) in LONG 75°W. What is the corresponding zone time and date in LONG 135°E?

- A. 0700, November 2nd
- B. 2200, November 1st
- C. 2200, October 31st
- D. 0700, November 1st

Correct answer: A

27. The magnitude of three stars is indicated. Which star is the brightest?

- A. Vega +0.1
- B. Antares +1.2
- C. Altair +0.9
- D. Cannot be determined; magnitude indicates size not brightness

Correct answer: A

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

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

Correct answer: A

29. Information about currents around Pacific Coast ports of the U.S. can be obtained in which publication?

- A. Tidal Current Tables
- B. Ocean Current Tables
- C. Nautical Almanac
- D. Tide Tables

Correct answer: A

30. Which is TRUE for the directive force acting on a gyrocompass?

- A. The force increases as the latitude increases, being maximum at the geographic poles
- B. The force is greatest when a vessel is near the Earth's magnetic equator
- C. The force increases as the latitude decreases, being maximum at the geographic equator
- D. The force remains the same at all latitudes

Correct answer: C

31. Your vessel is on course 180°T speed 22 knots. The apparent wind is from 70° off the port bow, speed 20 knots. What are the true direction and speed of the wind?

- A. 45°T, 21.0 knots
- B. 51°T, 24.0 knots
- C. 58°T, 21.2 knots
- D. 64°T, 26.0 knots

Correct answer: B

32. To avoid error, how should you read the scale of an aneroid barometer?

- A. With your eye to the left of the pointer
- B. With your eye directly in front of the pointer
- C. With your eye to the right of the pointer
- D. With your eye slightly above the meniscus

Correct answer: B

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

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

Correct answer: A

34. You should plot your dead reckoning position _____.

- A. from every estimated position
- B. every three minutes in pilotage waters
- C. from every fix or running fix
- D. only in pilotage waters

Correct answer: C

35. Which is TRUE of a preferred-channel buoy?

- A. They may be lettered
- B. They are spherical
- C. They show a white light
- D. All of the above

Correct answer: A

36. In North America, which direction do the majority of the weather systems move?

- A. From west to east
- B. From south to north
- C. From east to west
- D. From north to south

Correct answer: A

37. Advection fog is most commonly caused by _____.

- A. warm moist air being blown over a colder surface
- B. saturation of cold air by rain
- C. air being warmed above the dew point
- D. a rapid cooling of the air near the surface of the Earth at night

Correct answer: A

38. You are underway on course 050°T and your maximum speed is 13 knots. The eye of a hurricane bears 100°T, 120 miles from your position. The hurricane is moving towards 275°T at 25 knots. What course should you steer at 13 knots to have the maximum CPA?

- A. 339°
- B. 333°
- C. 326°
- D. 320°

Correct answer: B

39. Isobars on a weather map are useful in predicting which element of the weather?

- A. The relative humidity
- B. The dew point
- C. The temperature
- D. The wind velocity

Correct answer: D

40. Entering from seaward, what do triangular-shaped daymarks mark?

- A. The starboard side of the channel
- B. The centerline of the channel
- C. An obstruction where the preferred channel is to starboard
- D. Any special purpose areas

Correct answer: A

41. Your vessel is participating in the Voluntary Observing Ship Program, you are preparing WS Form B-80 as seen in illustration D041NG below. The dry bulb thermometer reads 34°F and the wet bulb thermometer reads 31°F. How would you encode the air temperature groups in the report?

- A. 10111, 2104/
- B. 10340, 2031/
- C. 10011, 2104/
- D. 10340, 2127/

Correct answer: C

42. Which condition(s) is(are) necessary for the formation of dew?

- A. A surface warmer than the dew point of the air
- B. Available nuclei in the air
- C. Moderate winds
- D. Clear skies

Correct answer: D

43. What does the Flinders bar on a magnetic compass compensate for?

- A. Permanent magnetism in ship's steel
- B. Vessel's inclination from the vertical
- C. Induced magnetism in horizontal soft iron
- D. Induced magnetism in vertical soft iron

Correct answer: D

44. Which is the standard meridian for the time zone +1?

- A. 15°W
- B. 7 1/2°E
- C. 0°
- D. 7 1/2°W

Correct answer: A

45. Which time meridian is used when computing the velocity of the current for Pensacola Bay, Florida?

- A. 75°00'W
- B. 82°30'W
- C. 97°30'W
- D. 90°00'W

Correct answer: D

46. Which of the following is the most accurate method of determining gyrocompass error while underway?

- A. Comparing the gyro azimuth of a celestial body with the computed azimuth of the body
- B. Comparing the gyro heading with the magnetic compass heading
- C. Determining from the chart the course made good between celestial fixes
- D. It cannot be determined accurately at sea due to drift of unknown currents.

Correct answer: A

47. A navigator fixing a vessel's position by radar _____.

- A. must use information from targets forward of the beam
- B. should only use radar bearings when the range exceeds the distance to the horizon
- C. should never use radar bearings
- D. can use radar information from one object to fix the position

Correct answer: D

48. According to Buys Ballot's law, when an observer in the Northern Hemisphere experiences a northwest wind, where is the center of low pressure located?

- A. Northwest of the observer
- B. West-southwest of the observer
- C. South-southeast of the observer
- D. Northeast of the observer

Correct answer: D

49. Which term is given to the mechanical lifting of air by the upslope slant of the terrain?

- A. Advective lifting
- B. Vertical lifting
- C. Topographic lifting
- D. Convective lifting

Correct answer: C

50. 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 352°T , and the variation is 4°W . If the heading of your vessel at the time of the sighting is 359° per standard magnetic compass, what is the correct deviation?

- A. 3°W
- B. 7°E
- C. 11°E
- D. 11°W

Correct answer: A

51. At evening stars, the first stars that should be observed are those with an azimuth in what quadrant?

- A. Eastern
- B. Northern
- C. Southern
- D. Western

Correct answer: A

52. What is a common unit of measure for atmospheric pressure?

- A. Cubic Feet
- B. Inches
- C. Degrees
- D. Tons

Correct answer: B

53. Where would you expect to find channels marked with the IALA-A Buoyage System?

- A. India
- B. Argentina
- C. Japan
- D. Canada

Correct answer: A

54. Which radar control reduces weak echoes out to a limited distance from the ship?

- A. The sensitivity time control (sea-clutter control)
- B. The receiver gain control
- C. The brilliance control
- D. The fast time constant (differentiator)

Correct answer: A

55. The dew point is reached when which condition occurs?

- A. The atmospheric pressure is 14.7 lbs. per square inch
- B. The air becomes saturated with water vapor
- C. The temperature of the air equals the temperature of the seawater
- D. The relative humidity reaches 50%

Correct answer: B

56. When cold air displaces warm air you have which type of front?

- A. A cold front
- B. An occluded front
- C. A warm front
- D. A stationary front

Correct answer: A

57. 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

Correct answer: C

58. What happens to the intensity of a hurricane as it reaches higher latitudes and cooler waters?

- A. Decreases
- B. Increases
- C. Remains the same
- D. None of the above

Correct answer: A

59. What are the only magnetic compass correctors that correct for both permanent and induced effects of magnetism?

- A. Heeling magnets
- B. Fore-and-aft magnets
- C. Athwartships magnets
- D. Quadrantal spheres

Correct answer: A

60. Under the IALA Buoyage Systems, which is TRUE of safe water marks?

- A. They may show a quick-flashing, Q(9)15s, white light
- B. They may show a white Morse (A) light
- C. They may show a composite group-flashing, Fl(2 + 1), red light
- D. They must show a composite group-flashing, Fl(2 + 1), green light

Correct answer: B

61. What is NOT a characteristic of cardinal marks?

- A. Yellow and black bands
- B. Directional orientation to a hazard
- C. White lights
- D. Square or triangular topmarks

Correct answer: D

62. The apparent wind's speed can be zero, but only when two conditions are present. One condition is that the true _____.

- A. wind's speed equals the ship's speed
- B. wind must be from dead ahead
- C. wind's speed must be zero
- D. wind must be on the beam

Correct answer: A

63. What does the numeral in the center of a wind rose circle on a pilot chart indicate?

- A. The average wind force on the Beaufort scale
- B. The average wind force in knots
- C. The percentage of calms
- D. The total number of observations

Correct answer: C

64. Which form of cloud, that is often known as "mackerel sky", is generally associated with fair weather?

- A. Cirrocumulus
- B. Nimbostratus
- C. Cumulonimbus
- D. Stratus

Correct answer: A

65. The equation of time is 12m 00s and the mean Sun is ahead of the apparent Sun. If you are on the central meridian of your time zone, at what zone time will the apparent Sun cross the meridian?

- A. 1200
- B. 1212
- C. 1148
- D. It cannot be determined from the information given.

Correct answer: B

66. The largest waves (heaviest chop) will usually develop where the wind blows _____.

- A. at right angles to the flow of the current
- B. against the flow of the current
- C. over slack water
- D. in the same direction as the flow of the current

Correct answer: B

67. Which publication requires infrequent corrections?

- A. List of Lights
- B. Coast Pilot
- C. Radio Navigational Aids
- D. Sailing Directions (Planning Guide)

Correct answer: D

68. Which defines a wave's fetch?

- A. The time in seconds required for two crests to pass a given point
- B. The distance a wave travels between formation and decay
- C. The stretch of water over which a wave-forming wind blows
- D. The measurement of a wave's steepness

Correct answer: C

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

- A. Isogonic lines
- B. Dip lines
- C. Magnetic declinations
- D. Magnetic latitudes

Correct answer: A

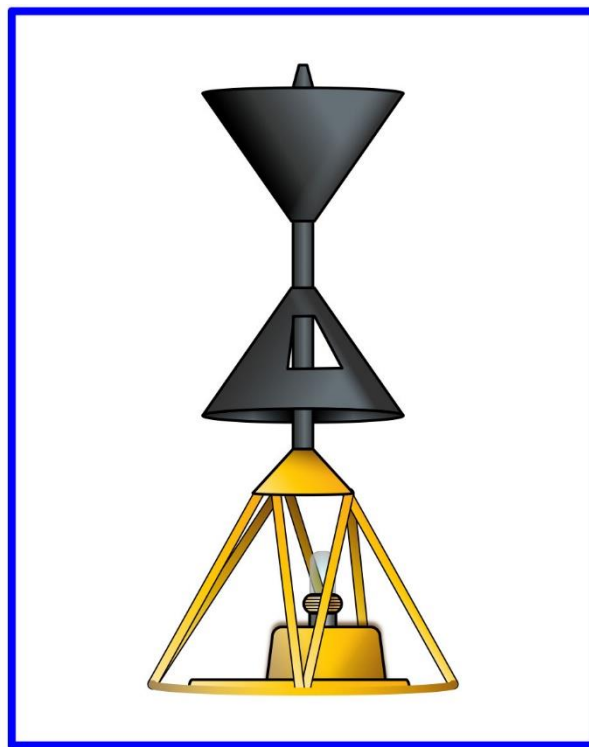
70. You are entering an east coast port and see a buoy with a yellow triangle painted on it. What does the symbol indicate?

- A. You are in the vicinity of the ICW
- B. The buoy is off station
- C. The buoy is a special mark
- D. The buoy designates a sharp turn in the channel

Correct answer: A



D024NG



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United States Coast Guard National Maritime Center



D041NG

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WEATHER REPORT FOR IMMEDIATE TRANSMISSION						
NO.	SHIP NAME	DATE SENT (UTC)	TIME SENT (UTC)	STA. CALLED	FREQUENCY	
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.						
INDICATOR	CALL SIGN	YYGGi _w	99L _a L _a L _a	Q _c L _o L _o L _o L _o	i _r i _x hVV	Nddff
BBXX			99		4	
00fff	1s _n TTT	2s _n T _d T _d T _d	4PPPP	5appp	7wwW ₁ W ₂	8N _h C _L C _M C _H
222D _s V _s	0s _s T _w T _w T _w	2P _w P _w H _w H _w	3d _{w1} d _{w1} d _{w2} d _{w2}	4P _{w1} P _{w1} H _{w1} H _{w1}	5P _{w2} P _{w2} H _{w2} H _{w2}	6I _s E _s E _s R _s
8S _w T _b T _b T _b	ICE	c _i S _i b _i D _i z _i	PLAIN LANGUAGE			TRANSMITTED BY
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