

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. 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.

2. After the recurvature of a hurricane's track, which describes the result of its forward speed?

- (A) The speed remains the same
- (B) The speed increases
- (C) The speed decreases
- (D) The speed varies during the day

If choice B is selected set score to 1.

3. You are outbound in a channel marked by a range astern. The range line is 273° T. You are steering 090° 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 093° T.
- (B) Come left until the range comes in line then alter course to 087° T.
- (C) Come right to close the range then when on the range steer 093° T.
- (D) Come right to 093° T.

If choice C is selected set score to 1.

4. 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.

5. Which symbol represents a 20-fathom curve?

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

If choice B is selected set score to 1.

- 6.** 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) That you have entered an area of shoal water or other hazard
 - (C) It is the identifying light characteristic of the lighthouse
 - (D) The lighthouse has lost power and has switched to emergency lighting

If choice B is selected set score to 1.

- 7.** 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.

- 8.** Which correction must be applied to an aneroid barometer reading?
- (A) Temperature error
 - (B) Gravity error
 - (C) Height error
 - (D) English to metric conversion error

If choice C is selected set score to 1.

- 9.** During the winter months, which is TRUE of the southeast trade winds?
- (A) The Southeast Trade winds are weaker than during the summer months
 - (B) The Southeast Trade winds are stronger than during the summer months
 - (C) The Southeast Trade winds are wetter than during the summer months
 - (D) The Southeast Trade winds are drier than during the summer months

If choice B is selected set score to 1.

- 10.** 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.

11. Which daymark has no lateral significance?

- (A) Green square
- (B) Red triangle
- (C) Square; top half green and bottom half red
- (D) Black and white diamond

If choice D is selected set score to 1.

12. Your vessel is steering course 027° per standard magnetic compass (psc), variation for the area is 19°W, and deviation is 2°E. The wind is from the north-northwest, producing a 5° leeway. What true course are you making good?

- (A) 015°T
- (B) 044°T
- (C) 049°T
- (D) 005°T

If choice A is selected set score to 1.

13. Entering from sea, how would a daymark on the port side of the channel be indicated on a chart?

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

If choice C is selected set score to 1.

14. Which term is given to a line on a weather chart connecting places which have the same barometric pressure?

- (A) Isobar
- (B) Isotope
- (C) Isotherm
- (D) Isallobar

If choice A is selected set score to 1.

15. Temperature and moisture characteristics are modified in a warm or cold air mass due to which factor?

- (A) Movement of the air mass
- (B) The heterogeneous nature of the air mass
- (C) Upper level atmospheric changes
- (D) Pressure changes in the air mass

If choice A is selected set score to 1.

16. Which measurement uses mean high water as the reference plane?

- (A) Heights above water of land features such as lights
- (B) Water depths on the East Coast only
- (C) Soundings on the East and West Coasts
- (D) All vertical measurements on charts

If choice A is selected set score to 1.

17. 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.

18. You are enroute to assist vessel A. Vessel A is underway at 5.5 knots on course 033°T, and bears 284°T at 43 miles from you. What is the course to steer and running time at 16 knots to intercept vessel A?

- (A) 265°, 2h 32m
- (B) 265°, 3h 13m
- (C) 303°, 3h 13m
- (D) 303°, 2h 32m

If choice D is selected set score to 1.

19. On the pole side of the high pressure belt in each hemisphere, the pressure diminishes. The winds along these gradients are diverted by the Earth's rotation toward the east. What is the name of these winds?

- (A) The prevailing westerlies
- (B) The geostrophic winds
- (C) The northeast trade winds
- (D) The southeast trades

If choice A is selected set score to 1.

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

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

If choice A is selected set score to 1.

21. 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.

22. Atmospheric pressure may be measured with which instrument?

- (A) A psychrometer
- (B) An aneroid barometer
- (C) A Thermometer
- (D) A refractor

If choice B is selected set score to 1.

23. What does the period of a lighted aid to navigation refer to?

- (A) The time required for the longest flash of each cycle
- (B) The time required for the light to complete each cycle
- (C) The official date of construction or establishment
- (D) The length of time between flashes of the light

If choice B is selected set score to 1.

24. Which of the following compensates for errors introduced when a vessel heels over?

- (A) The soft iron spheres on the arms of the binnacle
- (B) A single vertical magnet beneath the compass
- (C) The Flinders bar
- (D) Magnets placed in trays inside the binnacle

If choice B is selected set score to 1.

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

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

If choice B is selected set score to 1.

26. What does the shoreline on charts generally represent?

- (A) The mean low water spring line
- (B) The mean high water line
- (C) The mean low water line
- (D) The mean tide level

If choice B is selected set score to 1.

27. Which type of fog occurs on clear nights with very light breezes and forms when the earth cools rapidly?

- (A) Radiation fog
- (B) Advection fog
- (C) Convection fog
- (D) Frontal fog

If choice A is selected set score to 1.

28. Coral atolls, or a chain of islands at right angles to the radar beam, may show as a long line rather than as individual targets. What causes this distortion?

- (A) The pulse length of the radar
- (B) The effects of beam width
- (C) The multiple-target resolution factor
- (D) Limitations on range resolution

If choice B is selected set score to 1.

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

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

If choice A is selected set score to 1.

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

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

If choice C is selected set score to 1.

31. Which statement is TRUE concerning a Mercator projection?

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

If choice C is selected set score to 1.

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

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

If choice A is selected set score to 1.

33. Which are associated with Cumulonimbus clouds?

- (A) Dense fog and high humidity
- (B) Gusty winds, thunder, rain or hail, and lightning
- (C) A rapid drop in barometric pressure followed by darkness
- (D) Clear skies with the approach of a cold front

If choice B is selected set score to 1.

34. Ocean swells originating from a typhoon can move ahead of it at speeds near _____.

- (A) 10 knots
- (B) 20 knots
- (C) 30 knots
- (D) 50 knots

If choice D is selected set score to 1.

35. 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) East of the buoy
- (B) South of the buoy
- (C) West of the buoy
- (D) North of the buoy

If choice B is selected set score to 1.

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

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

If choice D is selected set score to 1.

37. 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 tropopause
- (B) The stratopause
- (C) The troposphere
- (D) The stratosphere

If choice C is selected set score to 1.

38. You are planning to enter an unfamiliar U.S. port. Which publication provides information about channel depths, dangers, obstructions, anchorages, and marine facilities available in that port?

- (A) Coast Pilot
- (B) Notice to Mariners
- (C) American Practical Navigator
- (D) Sailing Directions

If choice A is selected set score to 1.

39. 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) 03h 01m 58s fast
- (B) +2s
- (C) 01m 58s fast
- (D) -2s

If choice C is selected set score to 1.

40. 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. You determine the depth of the water beneath your keel to be _____.

- (A) 39 feet
- (B) 43 feet
- (C) 47 feet
- (D) 57 feet

If choice A is selected set score to 1.

41. 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) 150°T
- (B) 240°T
- (C) 060°T
- (D) 090°T

If choice A is selected set score to 1.

42. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships fog horn 6 seconds after the signal was sounded. What is the distance to the shore?

- (A) 1100 yards
- (B) 1000 yards
- (C) 900 yards
- (D) 1200 yards

If choice A is selected set score to 1.

43. 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.

44. In the Northern Hemisphere, if your vessel is in a hurricane's navigable semicircle where should you position the wind relative to the vessel?

- (A) On the starboard quarter, hold course and make as much speed as possible
- (B) On the port bow, hold course and make as much speed as possible until the hurricane has passed
- (C) On the port quarter, maintain course and make as much speed as possible
- (D) On the starboard bow and heave to until the hurricane has passed

If choice A is selected set score to 1.

45. The dry bulb temperature is 58°F and the wet bulb temperature is 44°F . What is the relative humidity?

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

If choice B is selected set score to 1.

46. Weather patterns in the Gulf of Mexico area of the United States are _____.

- (A) tropical over Florida and subtropical over the rest of the Gulf Coast area
- (B) extremely hot in summer
- (C) those of a tropical region
- (D) those of a transition zone between tropical and a temperate area

If choice D is selected set score to 1.

47. 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.

48. The distance between the surface of the water and the tidal datum is the _____.

- (A) charted depth
- (B) height of tide
- (C) range of tide
- (D) actual water depth

If choice B is selected set score to 1.

49. Which current is responsible for the movement of large quantities of ice into the North Atlantic shipping lanes?

- (A) Baffin Current
- (B) Iceland Current
- (C) Baltic Current
- (D) Labrador Current

If choice D is selected set score to 1.

50. At 0000 you fix your position and plot a new DR track line. At 0200 you again fix your position and it is 0.5 mile east of your DR. Which statement is TRUE?

- (A) The drift is 0.25 knot.
- (B) The current cannot be determined.
- (C) You must increase speed to compensate for the current.
- (D) The current is westerly at 0.5 knot.

If choice A is selected set score to 1.

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

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

If choice C is selected set score to 1.

52. You are enroute to assist vessel A. Vessel A is underway at 4.5 knots on course 233°T, and bears 264°T at 68 miles from you. What is the course to steer and running time at 13 knots to intercept vessel A?

- (A) 274°, 8h 35m
- (B) 254°, 8h 35m
- (C) 254°, 7h 37m
- (D) 274°, 7h 37m

If choice C is selected set score to 1.

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

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

If choice A is selected set score to 1.

- 54.** 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 022° .

HEADING	
PSC	PGC
030.5°	$- 024^{\circ}$
061.5°	$- 054^{\circ}$
092.0°	$- 084^{\circ}$
122.5°	$- 114^{\circ}$
152.0°	$- 144^{\circ}$
181.0°	$- 174^{\circ}$
210.0°	$- 204^{\circ}$
239.5°	$- 234^{\circ}$
269.0°	$- 264^{\circ}$
298.0°	$- 294^{\circ}$
327.5°	$- 324^{\circ}$
358.5°	$- 354^{\circ}$

- (A) 1.5° E
- (B) 0.5° E
- (C) 0.0°
- (D) 0.5° W

If choice C is selected set score to 1.

- 55.** 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) Converging
- (B) Spilling
- (C) Plunging
- (D) Surging

If choice D is selected set score to 1.

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

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

If choice C is selected set score to 1.

57. 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) 30 minutes before flood, one hour after an ebb
- (C) 30 minutes before
- (D) One hour after

If choice C is selected set score to 1.

58. 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°

If choice A is selected set score to 1.

59. Which is TRUE of Raster-scan chart data?

- (A) It is composed of files that are smaller than vector files
- (B) It is organized into many separate files
- (C) It is a digitized "picture" of a chart in one format and one layer
- (D) It is the only format recognized by IMO/IHO

If choice C is selected set score to 1.

60. In illustration D045NG below, which shape is a daymark warning of danger?

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

If choice B is selected set score to 1.

61. If you observe a rapid fall of barometric pressure, which action should you take?

- (A) Prepare for an onset of stormy weather with strong winds
- (B) Call the Coast Guard to verify the change
- (C) Know that the barometer is not working properly
- (D) Contact the NWS or a local radio station

If choice A is selected set score to 1.

62. 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.

63. If you were sailing in the North Pacific and were interested in the ice and iceberg limits, where could you find this information?

- (A) Pilot Chart
- (B) Coast Pilot
- (C) Notice to Mariners
- (D) None of the above

If choice A is selected set score to 1.

64. 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.

65. A special mark (yellow buoy), if lighted, may exhibit which light rhythm?

- (A) Morse "A"
- (B) Flashing
- (C) Occulting
- (D) Equal interval

If choice B is selected set score to 1.

66. 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) An arc should never be run forward.
- (B) The arc should be converted into a straight line using offsets and then run forward.
- (C) 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.
- (D) The distance between LOP's should be added to the radar range and a new arc swung.

If choice C is selected set score to 1.

67. Weather forecast messages are usually _____.

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

If choice A is selected set score to 1.

68. 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 $014^{\circ}T$, and the variation is $11^{\circ}E$. If the heading of your vessel at the time of the sighting is 009° per standard magnetic compass, what is the correct deviation?

- (A) $5^{\circ}E$
- (B) $5^{\circ}W$
- (C) $6^{\circ}E$
- (D) $6^{\circ}W$

If choice D is selected set score to 1.

69. The velocity of a rotary tidal current will be decreased when the Moon is at which phase?

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

If choice D is selected set score to 1.

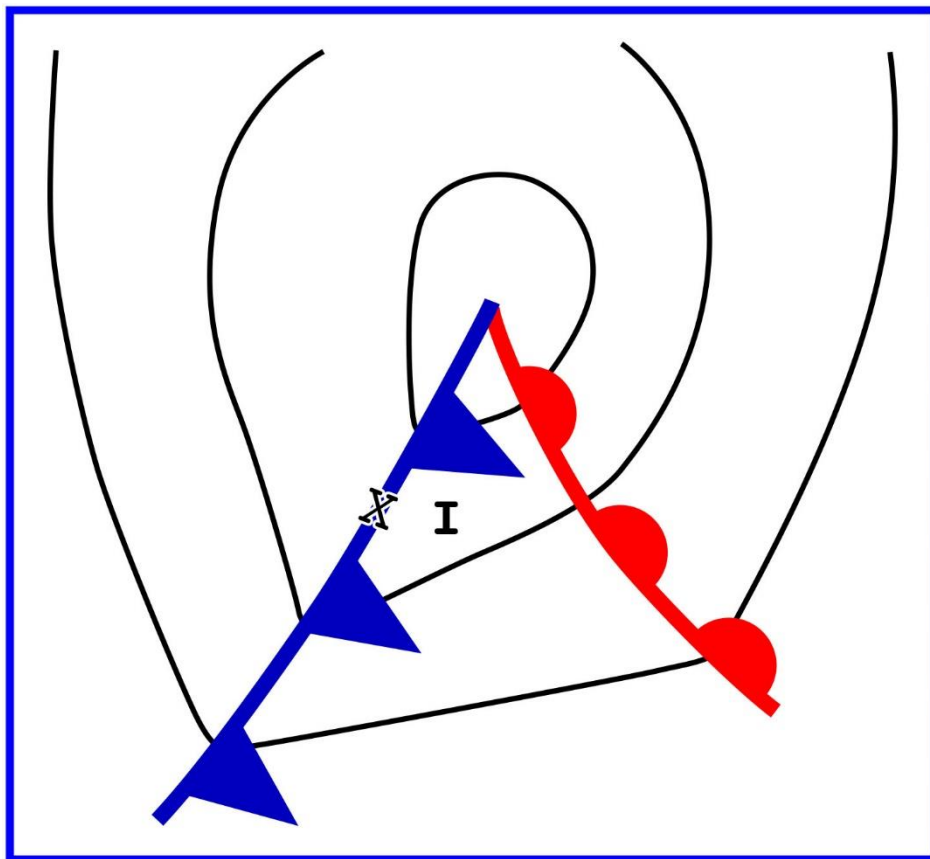
70. In the North Sea area, you sight a buoy showing a quick white light showing 6 flashes followed by one long flash at 15 second intervals. Which of the four topmarks in illustration D031NG below would be fitted to this buoy?

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

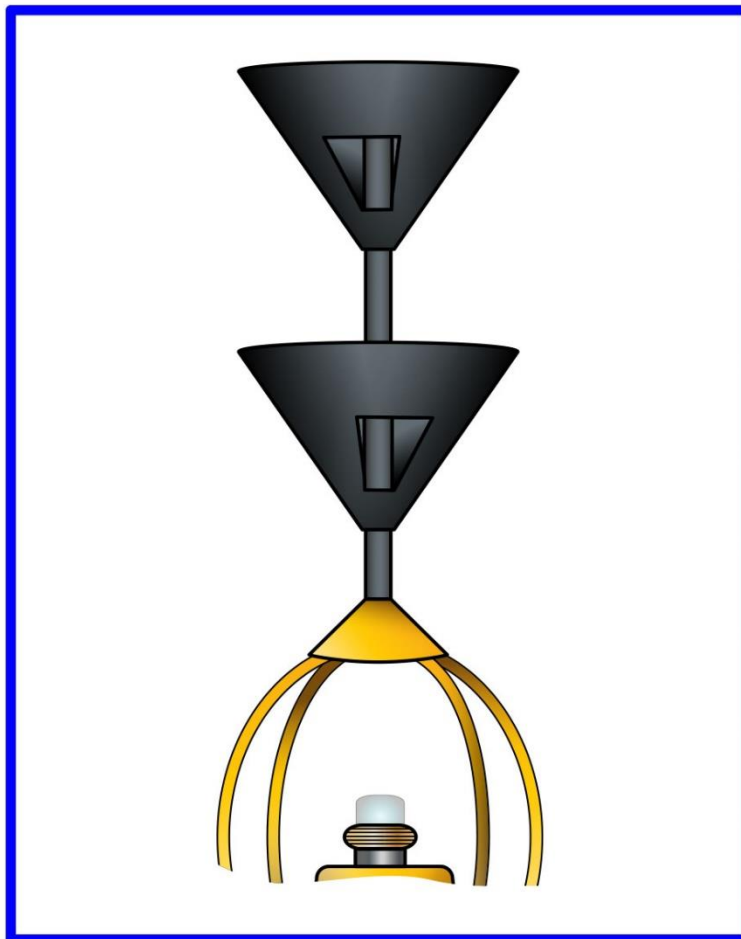
If choice C is selected set score to 1.

***If assessment score is 70% to 100% Pass
If assessment score is 0% to 69% Fail***

D013NG

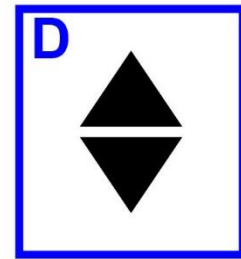
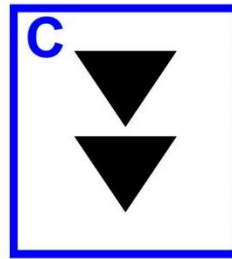
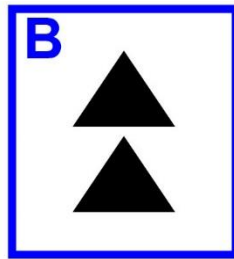
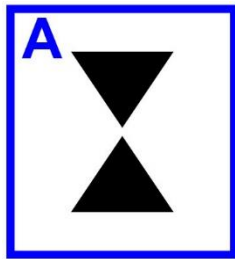


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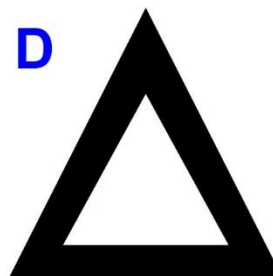
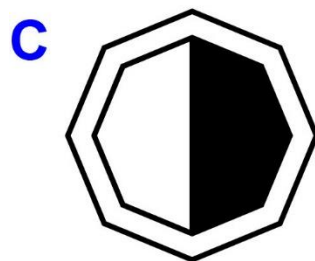
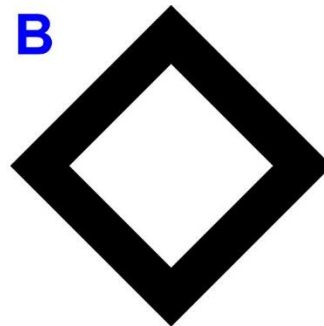
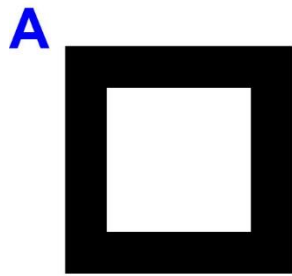


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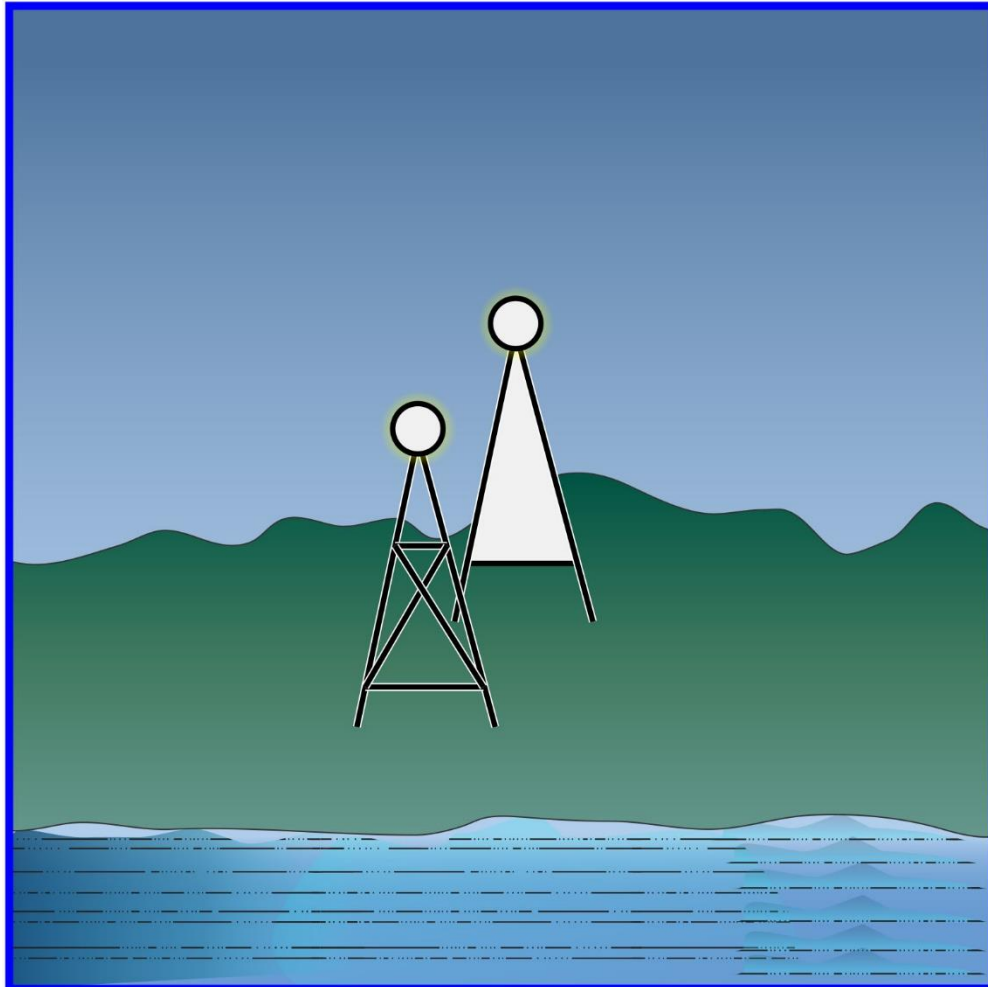
D031NG



D045NG



D047NG



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