

U.S.C.G. Merchant Marine Exam

First Assistant Engineer

Q516 Engineering Safety – Environmental Protection

(Sample Examination)

Choose the best answer to the following Multiple Choice Questions:

1. Your vessel has just been struck by another vessel. After meeting with the captain and chief mate, you have immediately ordered the vessel specific damage control procedures in the vessel's approved stability booklet to be enacted. Which of the following statements is true?
- (A) The Certificate of Documentation issued to the vessel will be the primary reference document in order to calculate free surface corrections.
 - (B) The Safety Management System will provide an IMO standard response for all collision response procedures, including damage control.
 - (C) The universal station billet assigning crew member responsibilities will provide adequate reference information to determine the adequate damage control response.
 - (D) The vessel general arrangement plan would be a critical reference document for your response providing accurate data showing watertight compartments, closures, vents and downflooding angles.

If choice D is selected set score to 1.

2. The wooden shoring shown in the illustration is bearing against the hatch coaming and is supporting a load in the direction indicated by the arrows. Which of the following statements is correct for this condition? Illustration SF-0018
- (A) Shore "A" will support the greatest load.
 - (B) Shore "A" will not slip under load.
 - (C) Shore "B" will support the load without it cracking.
 - (D) Shore "B" will crack at the pointed end.

If choice C is selected set score to 1.

3. Following a grounding, you can best determine that a SLACK fuel oil tank has been holed by _____.
- (A) checking fuel oil strainers
 - (B) sounding the tank
 - (C) waiting for the vessel to list
 - (D) examining tank boundaries

If choice B is selected set score to 1.

4. The wooden plug fitted tightly in the vent of a damaged tank may prevent the tank from _____.
- (A) filling completely
 - (B) developing free surfaces
 - (C) developing free surface moments
 - (D) collapsing

If choice A is selected set score to 1.

5. Progressive flooding in the engine room may be minimized by securing watertight boundaries and _____.

- (A) dumping fuel oil
- (B) evacuating the engine room
- (C) transferring reserve feedwater
- (D) pumping out flooded compartments

If choice D is selected set score to 1.

6. The safe and efficient use of the facepiece of a self-contained breathing apparatus is directly influenced by _____.

- (A) the maintenance of the facepiece
- (B) the donning of the facepiece
- (C) the stowing of the facepiece
- (D) all of the above

If choice D is selected set score to 1.

7. Kapok life jackets require proper care and should NOT be _____.

- (A) stowed near open flame or where smoking is permitted
- (B) used as seats, pillows, or foot rests
- (C) left on open decks
- (D) all of the above

If choice D is selected set score to 1.

8. Which of the following is required to be included in the fireman's (emergency) outfit?

- (A) Chemical protection face shield
- (B) Approved work vest
- (C) Self-contained breathing apparatus
- (D) 5 cell approved flashlight

If choice C is selected set score to 1.

9. An immersion suit should be equipped with a/an _____.

- (A) air bottle for breathing
- (B) whistle and hand-held flare
- (C) whistle, strobe light, and reflective tape
- (D) whistle, hand-held flare, and sea dye marker

If choice C is selected set score to 1.

10. In order to retrieve an inflatable life raft and place it on deck, you should heave on the _____.

- (A) lifelines
- (B) righting strap
- (C) sea anchor
- (D) towing bridle

If choice D is selected set score to 1.

11. When a rescue vessel approaches a survival craft in heavy seas, the person in charge of the survival craft should _____.

- (A) tie up to the rescue vessel
- (B) transfer only those personnel who are not seasick
- (C) wait for calmer weather before transferring personnel
- (D) transfer all personnel immediately

If choice C is selected set score to 1.

12. Each vessel in ocean and coastwise service must have an approved EPIRB. An EPIRB _____.

- (A) must be stowed in a manner so that it will float free if the vessel sinks
- (B) must be stowed where it is readily accessible for testing and use
- (C) is a device that transmits a radio signal
- (D) all of the above

If choice D is selected set score to 1.

13. The upper explosive limit (UEL) of a mixture of flammable vapors and air is defined as _____.

- (A) that concentration above which there is just enough flammable vapor to produce an explosion
- (B) that concentration above which the mixture is too rich to burn
- (C) the percentage of flammable vapor by volume in air sufficient to create an explosion
- (D) the percentage of oxygen present in the air sufficient to support combustion

If choice B is selected set score to 1.

14. The spreading of fire as a result of heat being carried through a vessel's ventilation system, is an example of heat transfer by _____.

- (A) conduction
- (B) convection
- (C) radiation
- (D) windage

If choice B is selected set score to 1.

15. To prevent oily rags from spontaneously igniting they should be _____.

- (A) cleaned thoroughly for reuse
- (B) kept in nonmetal containers
- (C) discarded as soon as possible
- (D) kept in the paint locker

If choice C is selected set score to 1.

16. Burning wood is considered to be which of the listed classes of fire?

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

If choice A is selected set score to 1.

17. A fire involving aluminum powder would be a class _____.

- (A) "A" fire
- (B) "B" fire
- (C) "C" fire
- (D) "D" fire

If choice D is selected set score to 1.

18. The most likely location for a liquid cargo fire to occur on a tanker would be _____.

- (A) in the amidships house
- (B) at the main deck manifold
- (C) at the vent header
- (D) in the pumproom

If choice D is selected set score to 1.

19. A simple precaution to reduce the possibility of accidental fires in the paint locker, is to _____.

- (A) label the fixed firefighting system
- (B) store paint cans on metal shelves only
- (C) not allow oily rags to accumulate in the space
- (D) place a portable fire extinguisher immediately outside the locker

If choice C is selected set score to 1.

- 20.** How would you ensure that your crew is prepared to combat a shipboard fire using ship's equipment?
- (A) Check training records, to see if crew members have attended a firefighting training course.
 - (B) Show crew generic fire training videos.
 - (C) Have them read a firefighting text book.
 - (D) Conduct required drills, simulating fire conditions and training with ship's equipment.

If choice D is selected set score to 1.

- 21.** You are reviewing emergency procedures with new crew members. How would you direct them to proceed if they hear the fire and emergency signal on the ship's general alarm or whistle?
- (A) Report directly to the scene of the emergency to help.
 - (B) Report to the bridge and wait further instructions.
 - (C) Report to their assigned duty station as posted on the Station Bill, so an accurate muster can be taken.
 - (D) Report to their stateroom and wait further instructions.

If choice C is selected set score to 1.

- 22.** Fire detecting systems on merchant vessels may be arranged to sense _____.
- (A) smoke
 - (B) rate of temperature rise
 - (C) ionized particles
 - (D) all of the above

If choice D is selected set score to 1.

- 23.** In preparation for an extended yard period, you are reviewing your ship's plans. You notice several bulkheads are labeled A60. What is indicated by the label A60?
- (A) Damage stability bulkhead, A Class, with bulkhead strength that will limit flooding for 60 minutes.
 - (B) Fire division boundary, A Class, with insulation that will limit temperature rise to below the allowable level for 60 minutes.
 - (C) Fire division boundary, A Class, with insulation that will limit temperature rise to below the allowable level for 60 seconds.
 - (D) Materials meeting construction yard specification A60.

If choice B is selected set score to 1.

24. During onboard training with your engineers you review the various firefighting agents available for use onboard a ship. Which of the following statements describes carbon dioxide as an extinguishing agent?

- (A) Carbon dioxide is a finely divided mist produced by either a high or low velocity fog nozzle. It is used for knocking down flames and cooling hot surfaces.
- (B) Carbon dioxide is a sodium or potassium bicarbonate or monosodium phosphate solution, usually applied from a semi-fixed or portable extinguisher.
- (C) Carbon dioxide may be applied through a fixed or semi-fixed system, or from a portable extinguisher. It is useful for inerting a compartment or for putting out small local fires.
- (D) Carbon dioxide is produced by a special foam nozzle or by a fixed system. It is used to form a blanket over the surface of burning liquids. It is effective only with liquids which are not appreciably soluble in water.

If choice C is selected set score to 1.

25. The most common cooling agent used for fighting fires on tank vessels is _____.

- (A) carbon dioxide
- (B) water
- (C) steam smothering
- (D) flue gas

If choice B is selected set score to 1.

26. Your chemical tanker was built to the IBC Code and has foam as the main firefighting medium. During one of your safety meetings you review the properties of foam as an extinguishing agent. Which of the following is a correct statement that would be appropriate to share during the meeting?

- (A) Foam will blanket the fire and cut off the supply of oxygen but it does not provide the best cooling protection for the firefighters.
- (B) Foam will blanket the fire and cut off the supply of oxygen and it also provides excellent cooling protection for the firefighters.
- (C) Foam will blanket the fire and cut off the supply of oxygen and is therefore perfectly suited to A, B and C class fires.
- (D) Foam will blanket the fire and cut off the supply of oxygen but it does generate toxic vapors that may harm the firefighters.

If choice A is selected set score to 1.

27. Which of the listed methods, is the most effective to fight a fire on the open deck of a vessel if using a dry chemical type fire extinguisher?

- (A) Approach the fire from the windward side.
- (B) Direct the extinguisher discharge at the base of the fire.
- (C) Move the discharge stream back and forth in a rapid sweeping motion.
- (D) All of the above.

If choice D is selected set score to 1.

28. During an inspection of a ships storeroom, you find sealed containers of chemicals labeled "potassium bicarbonate" and "potassium chloride". These chemicals are most commonly used aboard ship for _____.

- (A) recharging dry chemical fire extinguishers
- (B) descaling evaporator tubes
- (C) engine jacket water treatment
- (D) degreasing machinery parts

If choice A is selected set score to 1.

29. Which of the listed characteristics applies to a semi-portable CO₂ system?

- (A) It has a portable hose and nozzle.
- (B) The cylinders are mounted horizontally.
- (C) Each cylinder must weigh less than 50 pounds.
- (D) It has distribution piping installed permanently.

If choice A is selected set score to 1.

30. Water applied as a "fog" can be more effective than water applied as a "solid stream", because _____.

- (A) it reduces the total amount of water that must be pumped into the ship to fight a given fire
- (B) a given amount of water can absorb more heat when it is in the form of fog
- (C) it does not have to hit the seat of fire to be effective
- (D) of all of the above

If choice D is selected set score to 1.

31. If a fire hose is left unattended and under pressure with the nozzle shut off, the fire hose will _____.

- (A) burst under pressure
- (B) become elongated by 125%
- (C) remain motionless
- (D) lash about violently

If choice C is selected set score to 1.

32. Why is it essential to introduce CO₂ from a fixed fire extinguishing system, into a large engine room, as quickly as possible?

- (A) The fire may warp the CO₂ piping.
- (B) Updraft from the fire tends to carry the CO₂ away.
- (C) To keep the fire from spreading through the bulkheads.
- (D) Carbon dioxide takes a long time to disperse to all portions of a space.

If choice B is selected set score to 1.

33. Actuating the fixed CO₂ system should cause the automatic shutdown of the _____.

- (A) supply and exhaust ventilation
- (B) exhaust ventilation only
- (C) fuel supply only
- (D) mechanical and natural ventilation

If choice A is selected set score to 1.

34. An oil fire is reported in the purifier room bilge. How would you combat this fire?

- (A) Direct aqueous film forming foam in a straight stream into the fuel to extinguish the fire.
- (B) Direct a dry powder extinguisher at the base of the fire and discharge the powder in a sweeping motion to extinguish the fire.
- (C) Direct aqueous film forming foam off the overhead or nearby bulkhead, using a bank down or bounce off method to extinguish the fire.
- (D) With water using a low velocity fog applicator to extinguish the fire.

If choice C is selected set score to 1.

35. Your ship has a low-pressure carbon dioxide system that covers the engine room. Fire has been reported in the engine room and the decision has been made to dump the carbon dioxide system into the engine room. While following the procedures to release carbon dioxide you find one engine room supply fan damper that will not close. How should you proceed?

- (A) Cover the fan damper opening with a plastic tarp to stop the flow of air into the engine room and then continue with the release procedures.
- (B) Continue the release procedures and dump the carbon dioxide, after the release then try to seal the fan damper opening.
- (C) Continue the release procedures and dump the carbon dioxide with the damper still open.
- (D) Cover the fan damper opening with burlap bags to slow the flow of air into the engine room and then continue with the release procedures.

If choice A is selected set score to 1.

36. The most important characteristic of a fire extinguishing agent to be used on electrical fires is for the agent to be _____.

- (A) flame resistant
- (B) wet
- (C) easily removable
- (D) non-conducting

If choice D is selected set score to 1.

- 37.** As an engineer on a tanker of more than 1600 gross tons on an international voyage, how would you direct the fire team to combat a large cargo space fire?
- (A) Use the fixed carbon dioxide system to extinguish the fire.
 - (B) Use fixed water and foam systems to extinguish the fire.
 - (C) Use the inert gas system to extinguish the fire.
 - (D) Open the ullage caps and lower the level in tanks adjacent to the tank on fire.

If choice B is selected set score to 1.

- 38.** In fighting a fire in a fuel tank, the FIRST action you should attempt is to _____.
- (A) top off the tank to force out all vapors
 - (B) begin transferring the fuel to other tanks
 - (C) secure all sources of fresh air to the tank
 - (D) station someone at the fixed CO₂ release controls

If choice C is selected set score to 1.

- 39.** Your vessel is carrying a cargo of Ethane, which has caught fire. Which extinguishing agent(s) should be used?
- (A) Carbon dioxide, water fog
 - (B) Carbon dioxide, dry chemical
 - (C) Alcohol foam, water fog
 - (D) Carbon dioxide, water foam

If choice B is selected set score to 1.

- 40.** Your vessel is carrying a cargo of Methyl Ethyl Ketone (MEK), which has caught fire. Which extinguishing agents should be used?
- (A) Carbon dioxide, dry chemical, or alcohol foam.
 - (B) Carbon dioxide, dry chemical, or water foam.
 - (C) Water fog, dry chemical, or alcohol foam.
 - (D) Carbon dioxide, dry chemical, or water fog.

If choice A is selected set score to 1.

- 41.** As team leader of the ship's No.2 emergency squad, you have just informed the bridge that the fire in the galley has been extinguished. What would you instruct your squad to do next?
- (A) Send them to coffee.
 - (B) Restock the emergency locker; replacing any equipment used during the fire.
 - (C) Set a reflash watch in the galley.
 - (D) Refill any SCBA bottles used during the fire.

If choice C is selected set score to 1.

42. A fire has been reported in the ship's laundry room. As the senior engineer, you direct the team leader of the No.1 emergency squad to secure ventilation to the space. What would your next command be to the emergency team leader, before they can actually start extinguishing the fire?

- (A) Prepare extra fire hoses.
- (B) Prepare the lifeboats to abandon ship.
- (C) Have electrical power secured to the laundry room. A lock-out tag should be placed on the breaker or switch stating the circuit has been de-energized, to protect crew members from electrical shock.
- (D) Prepare extra portable fire extinguishers.

If choice C is selected set score to 1.

43. According to Coast Guard Regulations (46 CFR 30), a flammable liquid with a Reid vapor pressure of 8-1/2 psi or less, and a flash point of 80°F or below, is a grade _____.

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

If choice C is selected set score to 1.

44. By definition, combustible liquids are liquids which _____.

- (A) have a flash point of 80°F or higher
- (B) spontaneously ignite
- (C) give off flammable vapors at or below 80°F
- (D) are highly volatile with a flash point of 0°F

If choice A is selected set score to 1.

45. If diesel fuel vapors in a compartment are considered to be within the flammable range _____.

- (A) an explosion may occur if a source of ignition is present
- (B) the vapor air mixture is too lean to burn
- (C) the vapor air mixture is too rich to burn
- (D) the upper explosive limit has been exceeded

If choice A is selected set score to 1.

- 46.** Tankers carrying cryogenic cargoes, such as LNG, are fitted with gas detector systems alarmed at 30% of the lower explosive limit. If the gas detector alarm sounds, this means _____.
- (A) the detector sensor is sampling a space where the cargo vapor concentration is 30 percent by volume
 - (B) an explosion is about to take place
 - (C) the detector is sampling a space in which 30 percent of the atmosphere is explosive
 - (D) a flammable vapor concentration exists at the sample point, but it is too lean to burn

If choice D is selected set score to 1.

- 47.** Which of the following precautions are necessary when using any electrical equipment in a hazardous location, such as a cargo pumproom?
- (A) The pumproom is to be gas free.
 - (B) Each compartment where flammable gas is expected to accumulate is to be closed and secured.
 - (C) The adjacent compartments are to be gas free.
 - (D) All of the above.

If choice D is selected set score to 1.

- 48.** A fuel tank on a barge has been certified by a marine chemist as being "Safe for Men" and "Safe for fire." This condition may change if _____.
- (A) a product leaks into the certified tank
 - (B) the ambient temperature changes
 - (C) muck, sludge, or scale in the tank give off additional vapors
 - (D) all of the above

If choice D is selected set score to 1.

- 49.** As listed on a Safety Data Sheet (SDS), what is a liquid called that is having a flash point below 199.4°F (93°C)?
- (A) combustible liquid
 - (B) explosive liquid
 - (C) viscous liquid
 - (D) flammable liquid

If choice D is selected set score to 1.

50. With regards to a ship's Oil Record Book, an oil tanker of 150 gross tons and above must maintain entries in _____.

- (A) Part I only
- (B) Part II only
- (C) Both Part I and Part II
- (D) Part III

If choice C is selected set score to 1.

51. Your ship is working cargo in port when a hydraulic hose ruptures on the weather deck and oil spills into the harbor. Once the source of the oil spill has been secured, how would you proceed?

- (A) Follow the procedures outlined in the vessel's Shipboard Oil Pollution Emergency Plan (SOPEP) manual.
- (B) Refer to the ship's Fuel Oil Transfer Procedures for directions.
- (C) Refer to Oil Record Book for directions.
- (D) Follow the procedures outlined in the vessel's SOLAS manual.

If choice A is selected set score to 1.

52. Which of the following statements is true concerning the overboard discharge of vessel sewage at sea?

- (A) The vessel may discharge sewage into the sea, from an approved system which is not comminuted or disinfected, only if the vessel is more than 12 nautical miles from the nearest land.
- (B) The vessel may discharge disinfected and comminuted sewage into the sea, from an approved system, only if the vessel is more than 3 nautical miles from the nearest land.
- (C) The vessel must have an approved sewage plant.
- (D) All of the above.

If choice D is selected set score to 1.

53. You are the chief engineer of a vessel of more than 1600 gross tons on an international voyage. While bunkering lube oil in port, the hose fails and oil is spilled into the harbor. After securing the transfer, how would you proceed?

- (A) Call the local news outlets and report the oil spill.
- (B) Set out a boom around the ship to control the spread of the oil.
- (C) Perform post incident drug and alcohol testing on engine crew members not involved in the transfer operation.
- (D) Fill out a Declaration of Inspection for the transfer operation.

If choice B is selected set score to 1.

54. Your vessel was damaged in a collision and one compartment has partially flooded. The vessel has free communication with the sea with water flowing in and out as the vessel rolls. Which of the following is the most important factor contributing to free communication loss of stability?

- (A) Breadth of the damaged compartment affected.
- (B) Depth from the bottom of the damaged compartment to the waterline.
- (C) Distance from the vessel centerline to the centerline of the damaged compartment.
- (D) Whether or not the damaged compartment on the opposite side of the vessel is full or empty.

If choice C is selected set score to 1.

55. As chief engineer of an oceangoing passenger vessel, it is important to know the effect of trim and stability of your ship in the event of damage to a compartment. To minimize the impact of flooding in the event of a grounding, what should be your ship's safe practice regarding watertight doors and hatches?

- (A) All watertight doors in subdivision bulkheads shall be kept closed during navigation except when necessarily opened for working of the vessel, and in such cases they shall always be ready to be immediately closed.
- (B) All watertight doors in subdivision bulkheads shall be kept open during navigation to facilitate crew movement and in all cases they shall always be ready to be immediately closed.
- (C) All watertight doors in subdivision bulkheads shall be kept open during normal operation, except during adverse weather when they shall be closed.
- (D) All watertight doors in subdivision bulkheads shall be kept closed when the vessel is anchored except when necessarily opened for working of the vessel, and in such cases they shall always be ready to be immediately closed.

If choice A is selected set score to 1.

56. As chief engineer you should understand the concept of loll and its cause. An angle of loll is commonly caused by which of the following conditions?

- (A) A negative GM.
- (B) An off-center weight.
- (C) Free surface with G remaining below M.
- (D) High external force such as wind and current.

If choice A is selected set score to 1.

57. After transferring a weight forward on a vessel, the draft at the center of flotation will _____.

- (A) change, depending on the location of the LCG
- (B) increase
- (C) decrease
- (D) remain constant

If choice D is selected set score to 1.

58. The symbol shown in the illustration and used as a reference from which the height of the center of gravity is measured, is item number _____. Illustration SF-0022

- (A) 2
- (B) 3
- (C) 4
- (D) 5

If choice A is selected set score to 1.

59. As chief engineer your vessel has been damaged and one compartment has partially flooded. You understand that you have lost buoyancy and have added weight. If transverse stability in the flooded condition is poor or negative, every effort should be made to reduce the free surface and to lower the center of gravity. Of main importance is for you to assure which of the following is maintained?

- (A) Transfer water from ballast tanks to the opposite side of the damage.
- (B) A no list condition.
- (C) A GM that is at least neutral - G moved down to be at M.
- (D) As much reserve buoyancy as possible.

If choice D is selected set score to 1.

60. The difference between the initial trim of a vessel and the trim after a change in load has occurred is known as _____.

- (A) final trim
- (B) change of draft
- (C) change of trim
- (D) trim

If choice C is selected set score to 1.

61. As an engineer, you should be familiar with the conditions that will cause a vessel to transversely incline, list, or trim. Which of the following conditions causes a vessel to trim?

- (A) Combination of off-center weight and a negative GM.
- (B) Off-center weight.
- (C) Negative GM.
- (D) Fore and aft shift of G.

If choice D is selected set score to 1.

62. Reducing the free surfaces within a vessel, reduces the _____.

- (A) metacentric height
- (B) uncorrected height of the center of gravity
- (C) waterplane area
- (D) natural roll period

If choice D is selected set score to 1.

63. Following cargo loading operations, your vessel is experiencing an excessive at-sea hogging bending stress as shown in the illustration. What should you do to reduce the bending moment?
Illustration SF-0047

- (A) Add ballast to the aftpeak tank.
- (B) Add ballast to the forepeak tank.
- (C) Add ballast to an amidships tank.
- (D) Remove ballast from an amidships tank.

If choice C is selected set score to 1.

64. Yawing is the angular motion of the vessel about what axis?

- (A) Vertical
- (B) Transverse
- (C) Longitudinal
- (D) Centerline

If choice A is selected set score to 1.

65. According to the Pollution Prevention Regulations (33 CFR), who is to make the final decision of when oil transfer may begin?

- (A) Captain of the port officer
- (B) Designated persons in charge of vessel and facility
- (C) The senior deck officer present
- (D) Any local Coast Guard representative

If choice B is selected set score to 1.

66. What is the minimum period of time that the air supply for a self-contained breathing apparatus is required to last?

- (A) 10 minutes
- (B) 15 minutes
- (C) 30 minutes
- (D) 45 minutes

If choice C is selected set score to 1.

67. The potable water tanks on your vessel were drained for inspection and cleaning. What would you do before refilling with water?

- (A) Use hull paint to touch up bulkheads in the water tanks.
- (B) Disinfect the tank with an ammonia solution.
- (C) Disinfect the tank with a chlorine solution.
- (D) Nothing needs to be done before refilling the tanks.

If choice C is selected set score to 1.

68. As chief engineer on a vessel of more than 1600 gross tons on an international voyage, you and the first engineer are planning a welding job in the cargo-hold. How would you ensure that all safety precautions are reviewed prior to starting this job?

- (A) Have the first engineer verbally review fire safety with crew working on the job.
- (B) Have the first engineer review the SOLAS manual prior to starting the job.
- (C) Have the first engineer complete a hot-work permit after completing the job.
- (D) Have the first engineer complete a hot-work permit prior to starting the job.

If choice D is selected set score to 1.

69. Which of the following statements is true regarding oxygen indicators?

- (A) The instrument is capable of providing an immediate accurate reading of any space with no delay.
- (B) Prolonged exposure to gases such as CO₂ may affect the accuracy of the indicator.
- (C) A cotton filter placed in the end of the sampling tube prevents damaging the instrument when exposed to strongly acidic gases.
- (D) All of the above.

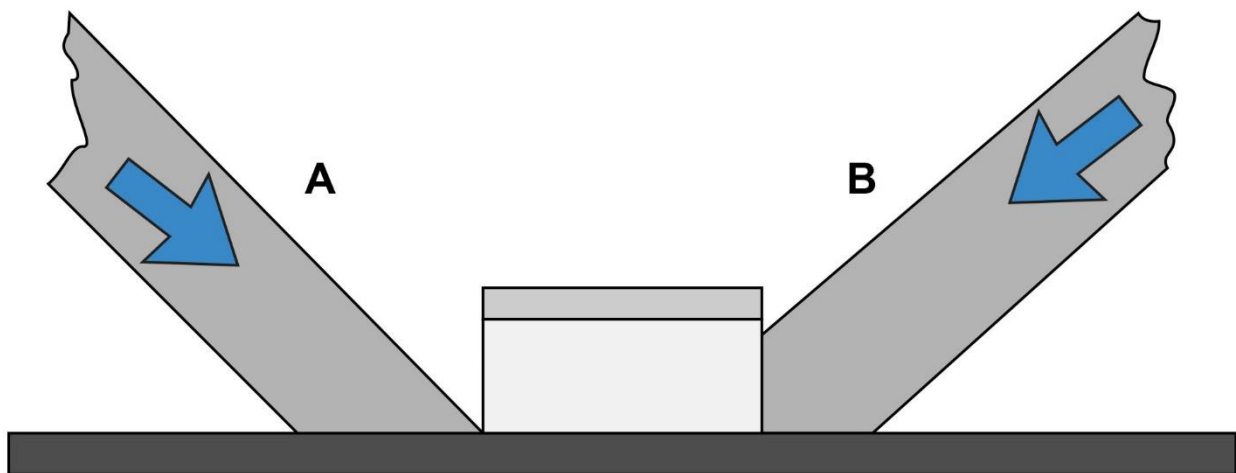
If choice B is selected set score to 1.

70. When taking samples of a tank atmosphere with an explosimeter, you should _____.

- (A) only sample around the deck longitudinals as gases are lighter than air
- (B) avoid sampling in the vicinity of deep webs to prevent false readings
- (C) sample only near the ullage openings as all vapors accumulate there
- (D) sample as much of the tank as possible, especially at the bottom

If choice D is selected set score to 1.

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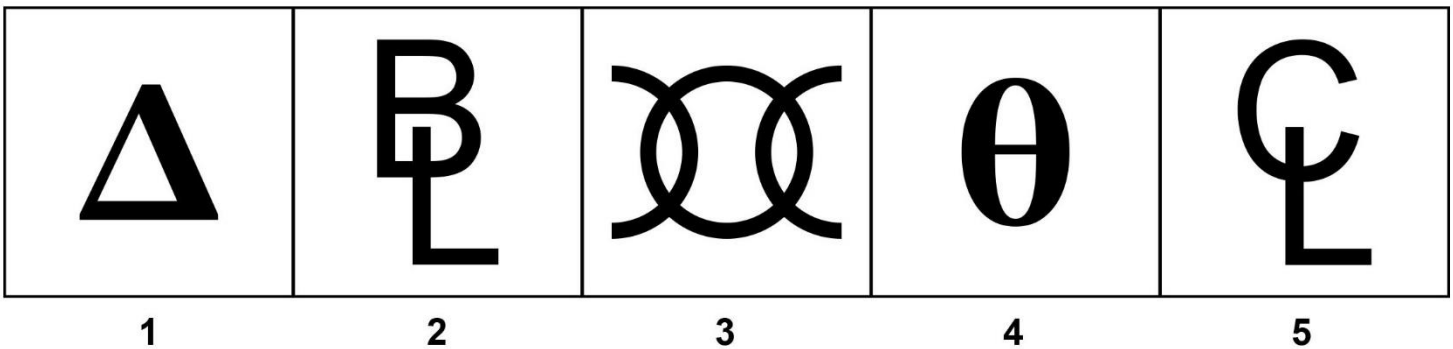


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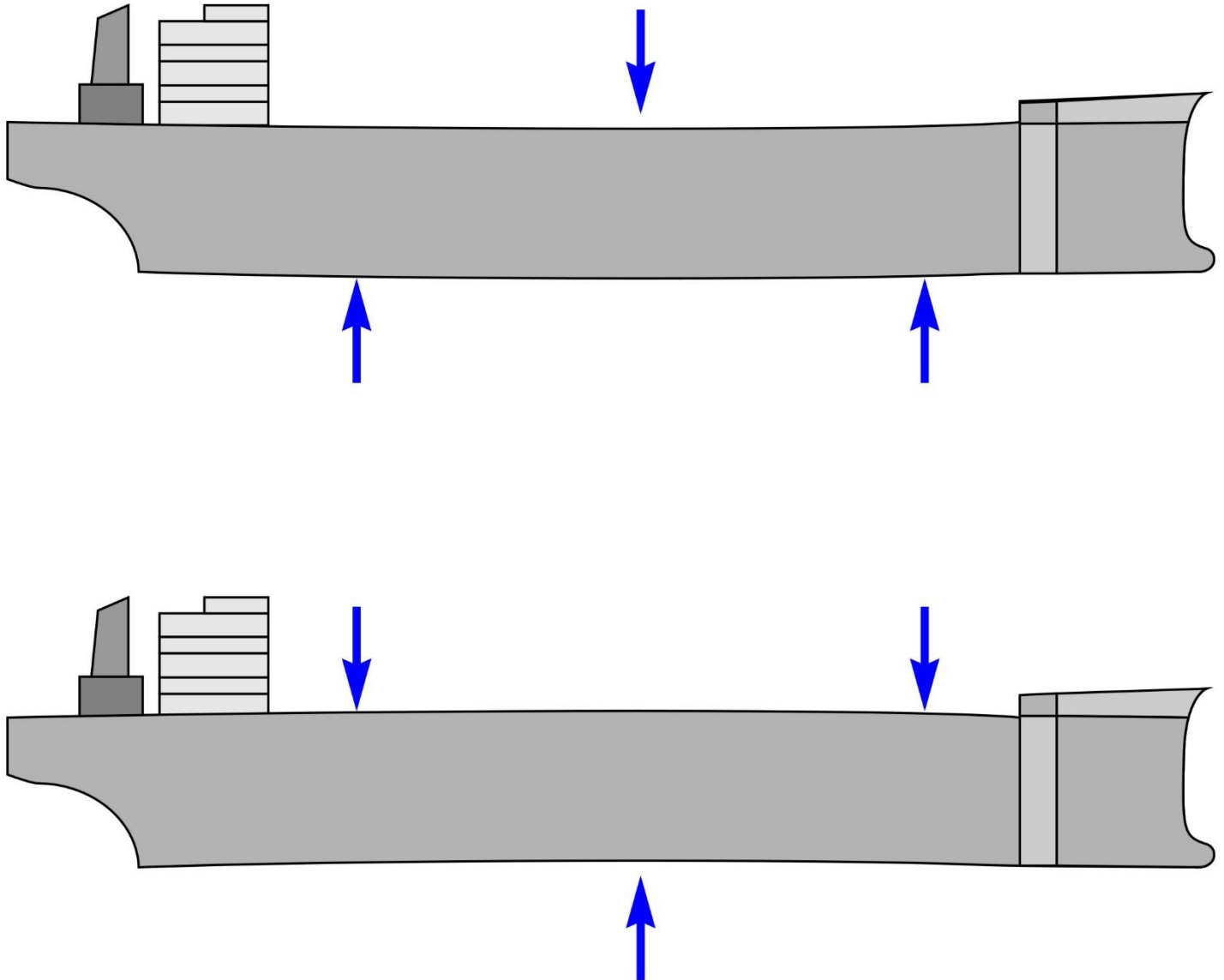
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Vessel Dimensional Data Symbols



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