

U.S.C.G. Merchant Marine Exam
Assistant Engineer, Limited
Q614 Engineering Safety-EP
(Sample Examination)

Choose the best answer to the following Multiple Choice Questions.

1. Which of the petroleum products listed has a flash point below 150°F?

- (A) Light fuel oils
- (B) Lubricating oils
- (C) Road oils
- (D) Asphalt

If choice A is selected set score to 1.

2. Which of the following statements represents the correct action to take when three crew members discover a fire?

- (A) One man report the fire, one man fight the fire, and one man act as a safety observer.
- (B) One man report the fire, and the other two men fight the fire.
- (C) One man report the fire, one man fight the fire and one man evacuate and secure the area.
- (D) All three men fight the fire and report it immediately after it is extinguished.

If choice C is selected set score to 1.

3. If a life raft should capsize, _____.

- (A) climb onto the bottom
- (B) swim away from the raft
- (C) right the raft using the righting straps
- (D) inflate the righting bag

If choice C is selected set score to 1.

4. The device shown in the illustration is carried aboard tank ships for _____. Illustration SF-0028

- (A) connecting shore side and ship's fire main
- (B) blanking cargo hoses after transfer operations are completed
- (C) use as a universal oil transfer connection
- (D) adapting ANSI and non-ANSI fuel hose flanges

If choice A is selected set score to 1.

5. A vessel trimmed down by the bow has _____.

- (A) a low mean draft
- (B) a greater draft aft than forward
- (C) zero trim
- (D) a greater draft forward than aft

If choice D is selected set score to 1.

6. Static water pressure on the hull of a ship is greatest at the _____.

- (A) bow
- (B) stern
- (C) boot topping
- (D) keel

If choice D is selected set score to 1.

7. In heavy seas the helmsman should steer the survival craft _____.

- (A) into the seas
- (B) broadside to the seas
- (C) in the same direction as the seas
- (D) in a series of figure-eights

If choice A is selected set score to 1.

8. When compared to other fire extinguishing agents, water fog _____.

- (A) has the greatest ability to produce foam
- (B) has the greatest cooling ability
- (C) will completely remove toxic fumes from the air
- (D) will completely remove combustible vapors from the air

If choice B is selected set score to 1.

9. A health hazard term listed on a material safety data sheet (MSDS) that indicates allergic-like reaction in some people after repeated exposure is _____.

- (A) sensitizer
- (B) pyrophoric hazard
- (C) oxidizer
- (D) skin contact hazard

If choice A is selected set score to 1.

10. If a fire occurs in an electric cable, in which the inner layers of insulation, or the insulation covered by armor is burning, you should _____.

- (A) secure power to the cable
- (B) cut the cable with an insulated cable cutter
- (C) separate the two ends
- (D) all of the above

If choice D is selected set score to 1.

11. In order to prevent the unnecessary release of hydrocarbons to atmosphere, when taking on departure ballast, one method used is to _____.

- (A) allow entering ballast to displace the inert gas to a tank where cargo is currently being discharged
- (B) manually open the pressure/vacuum device
- (C) use blowers to purge the inert gas from tanks
- (D) completely open the mast riser valve

If choice A is selected set score to 1.

12. Stability is determined principally by the relationship of the center of gravity and the _____.

- (A) keel
- (B) center of buoyancy
- (C) center of flotation
- (D) aft perpendicular

If choice B is selected set score to 1.

13. In accordance with 33 CFR Subchapter O (Pollution), a shipboard oil pollution emergency plan is required to be reviewed _____.

- (A) annually only
- (B) biennially only
- (C) quad-annually only
- (D) only once every five years

If choice A is selected set score to 1.

14. When should you expect to find an insulating flange in a fueling hose?

- (A) When static electricity is not expected to be a problem.
- (B) When the terminal is equipped with a cathodic protection system.
- (C) When transferring LNG.
- (D) When a bonding cable is employed.

If choice B is selected set score to 1.

15. 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.

16. 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.

17. Pitching is the rising and falling motion of the bow of a ship oscillating about which axis?

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

If choice A is selected set score to 1.

18. An oxygen indicator will detect _____.

- (A) the presence of harmful amounts of carbon monoxide
- (B) concentrations of explosive gas
- (C) an oxygen deficiency in a space
- (D) all of the above

If choice C is selected set score to 1.

19. Which of the following limitations is correct regarding gas or filter masks?

- (A) A maximum of only 30 minutes of protection is afforded with a single canister when in atmospheres containing highly toxic gases.
- (B) All canisters must be discarded within 24 hours when the seal becomes broken.
- (C) A canister is reliable for up to 5 years from the date of manufacture, as long as the seal is unbroken.
- (D) All of the above.

If choice C is selected set score to 1.

20. A fire can be extinguished by removing _____.

- (A) the fuel
- (B) the heat
- (C) the oxygen
- (D) any of the above

If choice D is selected set score to 1.

21. In accordance with 33 CFR Subchapter O (Pollution), which of the following operations aboard a tanker must be recorded in the Oil Record Book on a tank-to-tank basis according to Coast Guard Regulations?

- (A) The discharge overboard in port or at sea of any bilge water accumulated in machinery spaces.
- (B) The loading or unloading of any or all oil cargo.
- (C) Any internal transfer of oil cargo during a voyage.
- (D) All of the above.

If choice D is selected set score to 1.

22. In accordance with 46 CFR Subchapter W, the fuel tanks of motor-propelled lifeboats shall be _____.

- (A) constructed so as to be completely spill proof
- (B) emptied and gas freed when the ship is dry-docked
- (C) emptied and the fuel changed at least once each year
- (D) hydrostatically tested at each inspection for certification

If choice C is selected set score to 1.

23. The longer an oil fire is permitted to burn, the _____.

- (A) easier it is to extinguish
- (B) less chance there is of reignition
- (C) harder it is to extinguish
- (D) easier it is to control

If choice C is selected set score to 1.

24. Which of the following procedures reduces the possibility of an interior ventilation duct fire from rapidly spreading?

- (A) Having a portable CO₂ ready at each duct opening.
- (B) Keeping the duct exterior clean.
- (C) Having a fire hose charged at each duct opening.
- (D) Keeping the duct interior clean.

If choice D is selected set score to 1.

25. A fire involving trash and paper waste would be classified as a _____.

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

If choice A is selected set score to 1.

26. Before entering any space that has been sealed, its oxygen level should be tested. What level of oxygen in the space is equal to fresh air?

- (A) 10.0%
- (B) 15.8%
- (C) 20.8%
- (D) 25.8%

If choice C is selected set score to 1.

27. Hazardous conditions exist which may result in spontaneous combustion when _____.

- (A) powdered aluminum is stowed dry
- (B) oil soaked rags are stowed in the machine shop
- (C) dry metal turnings accumulate
- (D) all of the above

If choice B is selected set score to 1.

28. 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 pump room

If choice D is selected set score to 1.

29. Annual servicing of a hand portable CO₂ fire extinguisher includes _____.

- (A) inspecting the pressure gauge to ensure the needle is within operating range
- (B) hydrostatic testing of the cylinder
- (C) weighing the cylinder and recharging if weight loss exceeds 10% of the weight of the charge
- (D) discharging, cleaning inside, and recharging

If choice C is selected set score to 1.

30. Tankers carrying cryogenic cargoes, such as LNG, are fitted with gas detector systems which are designed to activate an alarm at 30% of the lower explosive limit. If an LNG gas detector alarm sounds, this means _____.

- (A) the detector is sampling a space in which 30 percent of the atmosphere is explosive
- (B) a flammable vapor concentration exists at the sample point, but it is too lean to burn
- (C) an explosion is about to take place
- (D) the detector sensor is sampling a space where the cargo vapor concentration is 30 percent by volume

If choice B is selected set score to 1.

31. (2.5.13.2-1) The symbol shown in the illustration used to represent displacement is _____.
Illustrations SF-0022

- (A) 1
- (B) 2
- (C) 3
- (D) 4

If choice A is selected set score to 1.

32. By definition, an example of a flammable liquid is _____.

- (A) animal and vegetable oils
- (B) caustic potash
- (C) kerosene
- (D) gasoline

If choice D is selected set score to 1.

33. Which of the following conditions is true concerning flammable liquid vapors with a concentration above the upper explosive limit?

- (A) The mixture is too rich to burn.
- (B) Conditions are perfect for combustion.
- (C) The vapor is about to explode.
- (D) The mixture is too lean to burn.

If choice A is selected set score to 1.

34. During cargo operations, a deck fire has occurred due to a leaking cargo line. You should FIRST _____.

- (A) stop the transfer of cargo
- (B) prevent the spread of fire with a foam dam
- (C) apply CO₂ on the burning fuel at its source
- (D) blanket the cargo spill with foam

If choice A is selected set score to 1.

35. One consideration for determining the safest maximum rate at which bunker fuel may be received is by the _____.

- (A) number of tanks to be filled
- (B) type of fuel transfer pump
- (C) distance to the fuel storage tanks ashore
- (D) size of the fuel storage tanks ashore

If choice A is selected set score to 1.

36. Increasing the free surface of a confined liquid has the effect of raising the _____.

- (A) virtual height of the center of gravity
- (B) uncorrected "KG"
- (C) metacentric height
- (D) metacenter

If choice A is selected set score to 1.

37. Fire hoses located at protected fire stations must always be _____.

- (A) open to the air to prevent rot
- (B) supplied with a smooth bore nozzle
- (C) capped on the ends for protection
- (D) connected to the fire hydrant

If choice D is selected set score to 1.

38. Radiation can cause a fire to spread by _____.

- (A) transmitting the heat of a fire through the ship's metal
- (B) burning liquids flowing into another space
- (C) heated gases flowing through ventilation systems
- (D) the transfer of heat across an unobstructed space

If choice D is selected set score to 1.

39. Which type of respiratory protection is preferable for the repair/investigation personnel in a hydrogen sulfide (H₂S) environment?

- (A) Emergency Escape Breathing Apparatus (EEBA)
- (B) U.S. Navy Oxygen Breathing Apparatus (OBA)
- (C) Positive Self-Contained Breathing Apparatus (SCBA)
- (D) Self-Contained Demand-Type Breathing Apparatus (SCDBA)

If choice C is selected set score to 1.

40. A vessel which is subjected to "hogging" _____.

- (A) has its main deck plating under tensile stress
- (B) has its main deck plating under compressive stress
- (C) has its bottom plating under compressive stress
- (D) has its bottom plating under tensile stress

If choice A is selected set score to 1.

41. You are in compartment "A", shown in the illustration, and suspect a fire in compartment "B". In order to check for and confirm the fire in compartment "B" you should _____. Illustration SF-0005

- (A) feel the bulkhead
- (B) tap the bulkhead
- (C) open the watertight door
- (D) move a lighted candle along watertight door seal

If choice A is selected set score to 1.

42. The component shown in the illustration would be installed in which of the following types of fire detection systems? Illustration SF-0004

- (A) Line-type pneumatic
- (B) Fixed temperature
- (C) Rate-of-rise
- (D) Combined fixed temperature and rate-of-rise

If choice B is selected set score to 1.

43. A specific document which identifies a chemical, and lists its physical properties, health hazards, required controls, firefighting procedures, cleanup methods, waste disposal, and the safe handling and storage requirements, is commonly called a _____.

- (A) Physical/Chemical Characteristics Document
- (B) Hazardous Chemical Information Sheet
- (C) Material Safety Data Sheet
- (D) Hazardous Chemical Loading Document

If choice C is selected set score to 1.

44. The wooden plug fitted tightly in the vent of a damaged tank may prevent the tank from _____.

- (A) collapsing
- (B) developing free surface moments
- (C) developing free surfaces
- (D) filling completely

If choice D is selected set score to 1.

- 45.** While in a foreign port, burning and welding repairs are to be carried out on a section of heating coil located in a tank having last contained a grade "D" product. Which of the following procedures should be followed when a certified marine chemist is not available?
- (A) It is solely the chief engineer's responsibility to ensure all safety precautions are observed, and all entries are to be made in the engine room log.
 - (B) Repairs should proceed as scheduled since a chemist's certificate is not required for that type of work.
 - (C) The repair work cannot be done at this time due to the lack of the chemist's certificate.
 - (D) Prior to any hot-work, an inspection must be made by the senior officer present, and an entry made in the official logbook.

If choice D is selected set score to 1.

- 46.** Which of the gases listed is the poisonous gas most likely to be found in a closed compartment involved in a fire?
- (A) Nitrogen
 - (B) Hydrogen
 - (C) Carbon dioxide
 - (D) Carbon monoxide

If choice D is selected set score to 1.

- 47.** 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) 5
 - (B) 4
 - (C) 3
 - (D) 2

If choice D is selected set score to 1.

- 48.** Victual waste is _____.
- (A) the final waste product of a manufacturing process
 - (B) the resultant sludge that is collected after water washing a boiler
 - (C) the final discharge of sewage treatment plants
 - (D) any garbage that comes from food or food provisions

If choice D is selected set score to 1.

49. When using foam, a "Class B" fire is extinguished by _____.

- (A) replacing the fuel
- (B) cooling the surface
- (C) smothering the fire
- (D) all of the above

If choice C is selected set score to 1.

50. 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.

51. The hand brake of a lifeboat winch is _____.

- (A) manually disengaged when hoisting a boat
- (B) applied by dropping the counterweighted lever
- (C) controlled by the centrifugal brake mechanism
- (D) automatically engaged if lowering speed is excessive

If choice B is selected set score to 1.

52. The airborne concentrations of substances (such as hydrogen sulfide) under which nearly all workers may be repeatedly exposed without adverse effects are called _____.

- (A) exposure limits
- (B) concentration limits
- (C) threshold limit values
- (D) substance limit values

If choice C is selected set score to 1.

53. Which of the methods shown in the illustration is the correct way to fit shoring? Illustration SF-0016

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

If choice A is selected set score to 1.

54. Which of the following statements is true concerning Halon 1301 fire extinguishing equipment?

- (A) Halon extinguishes the fire by smothering action.
- (B) The agent cannot be used on electrical fires because it leaves a residue.
- (C) The agent is highly toxic at normal room temperature.
- (D) For portable extinguishers, the agent is only available in a 2 pound unit.

If choice D is selected set score to 1.

55. A hand portable CO₂ fire extinguisher is effective on burning oil only _____.

- (A) if applied in connection with foam
- (B) to prevent rekindling
- (C) if applied promptly
- (D) if attempts to extinguish the fire with low velocity fog have failed

If choice C is selected set score to 1.

56. You are involved in an emergency landing of a helicopter on the water. You should inflate your life jacket _____.

- (A) upon entering the helicopter
- (B) prior to reaching the water
- (C) after reaching the water, but prior to exiting the helicopter
- (D) after exiting clear of the helicopter

If choice D 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) decrease
- (C) increase
- (D) remain the constant

If choice D is selected set score to 1.

58. Your ship has run aground and it is necessary to determine whether or not a compartment has flooded. Therefore, you should _____.

- (A) tap the bulkhead with a hammer to check for a water level
- (B) open the watertight door and take a quick look
- (C) feel the bulkhead to see if it is hot
- (D) open the hatch dogs on the side away from the hinges

If choice A is selected set score to 1.

59. (2.5.8.1-9) In firefighting, the term "protecting exposures" means _____.

- (A) protecting exposed areas of the superstructure from flames
- (B) keeping flames from burning at the tank vents
- (C) protecting firefighters from direct exposure to the heat of the fire
- (D) taking measures to prevent the spread of fire from the involved compartment to an adjacent compartment

If choice D is selected set score to 1.

60. In accordance with 33 CFR Subchapter O (Pollution), when off loading garbage to another ship, your records must identify that ship by name and which of the following?

- (A) operator's name of record
- (B) home port
- (C) master's name
- (D) official number

If choice D is selected set score to 1.

61. In the Oil Record Book, a comprehensive list of operational items are grouped into operational sections. Each section is codified by a/an _____.

- (A) letter
- (B) abbreviation
- (C) number
- (D) all of the above

If choice A is selected set score to 1.

62. A class "D" fire would involve the burning of _____.

- (A) diesel oil
- (B) dunnage
- (C) electrical insulation
- (D) magnesium

If choice D is selected set score to 1.

63. When the cotton cover of a fire hose becomes oily or greasy, it should be washed with a solution of mild soapy fresh water and _____.

- (A) a soft-bristled brush
- (B) paint thinner
- (C) a wire brush
- (D) cornstarch

If choice A is selected set score to 1.

64. To activate an air regeneration canister on a survival craft, you _____.

- (A) put it into a container of water
- (B) tear off the tabs on the canister
- (C) turn it upside down
- (D) push "on" button

If choice B is selected set score to 1.

65. Which of the following hazards is associated with the handling of petroleum products?

- (A) Asphyxiation
- (B) Fire
- (C) Explosion
- (D) All of the above

If choice D is selected set score to 1.

66. When required to work in an area where explosive gases may accumulate, you should use tools which are _____.

- (A) approved by the Coast Guard
- (B) high carbon steel
- (C) fixed with a ferrous cover
- (D) non-sparking

If choice D is selected set score to 1.

67. In accordance with MARPOL (33 CFR Subchapter O), the definition of medical waste does NOT include which of the following?

- (A) dialysis wastes
- (B) pathological wastes
- (C) expired pharmaceuticals
- (D) sharps

If choice C is selected set score to 1.

68. A tank or compartment is "gas free" when there is an absence of dangerous concentrations of _____.

- (A) any combustible liquid
- (B) all flammable liquids
- (C) flammable or toxic gases
- (D) residues from cargo oil

If choice C is selected set score to 1.

69. The class of fire on which a blanketing effect is essential to extinguish the fire is _____.

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

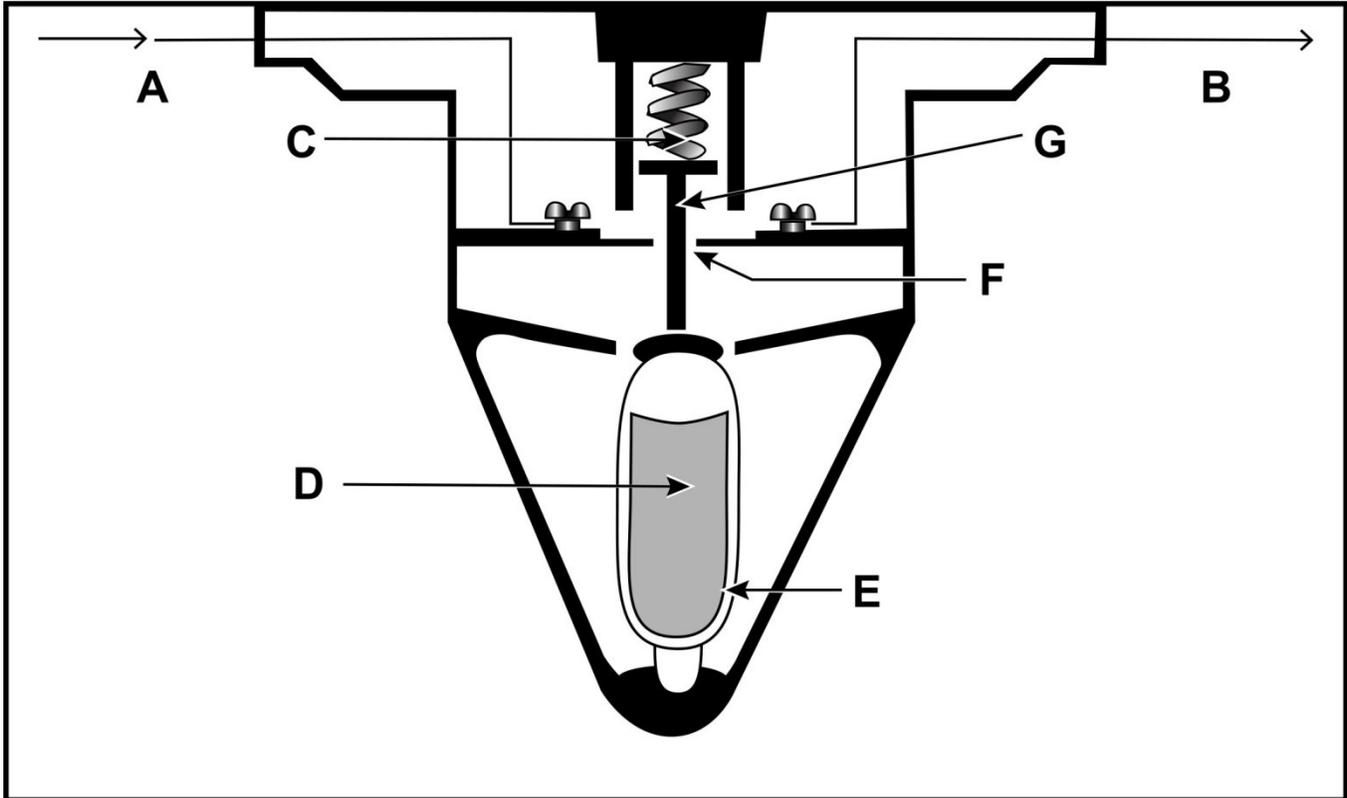
If choice B is selected set score to 1.

70. In accordance with 33 CFR Subchapter O (Pollution), where will you find the procedures for the reporting of oil discharge into the water?

- (A) The vessel's Certificate of Inspection
- (B) The vessel's International Oil Pollution Prevention Certificate
- (C) The vessel's Oil Transfer Procedures
- (D) The vessel's Oil Record Book

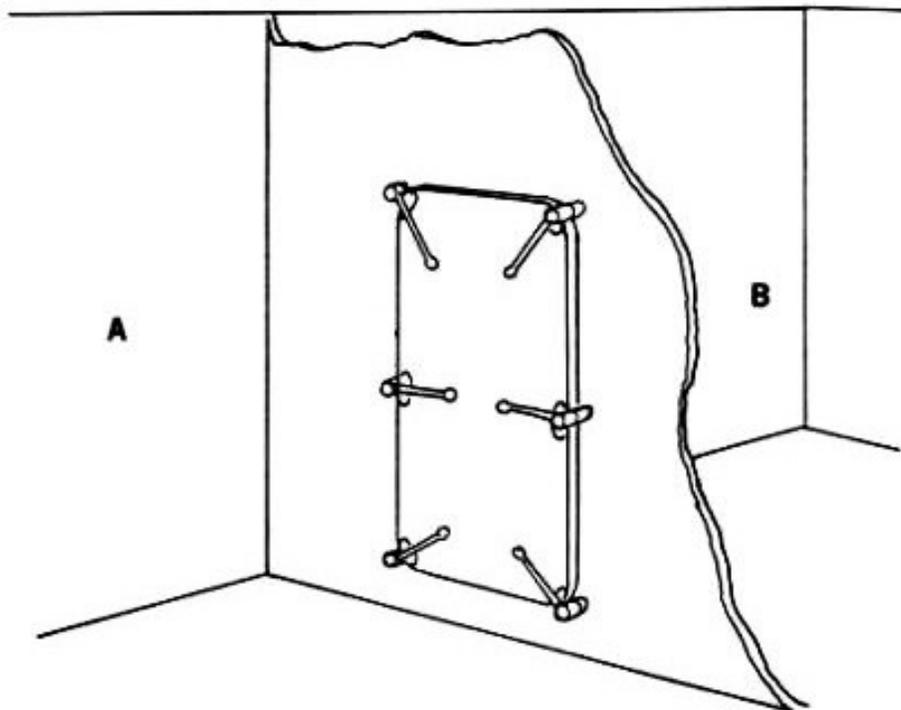
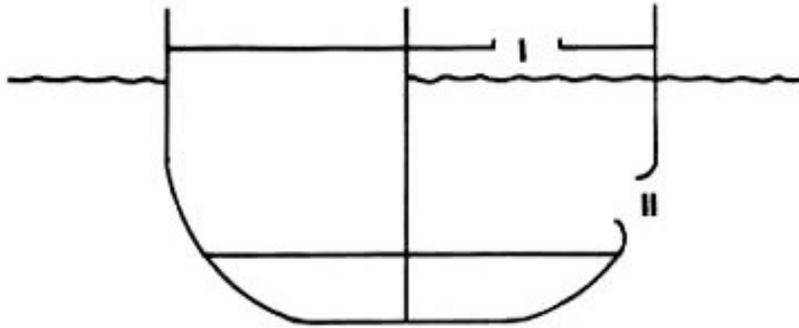
If choice C is selected set score to 1.

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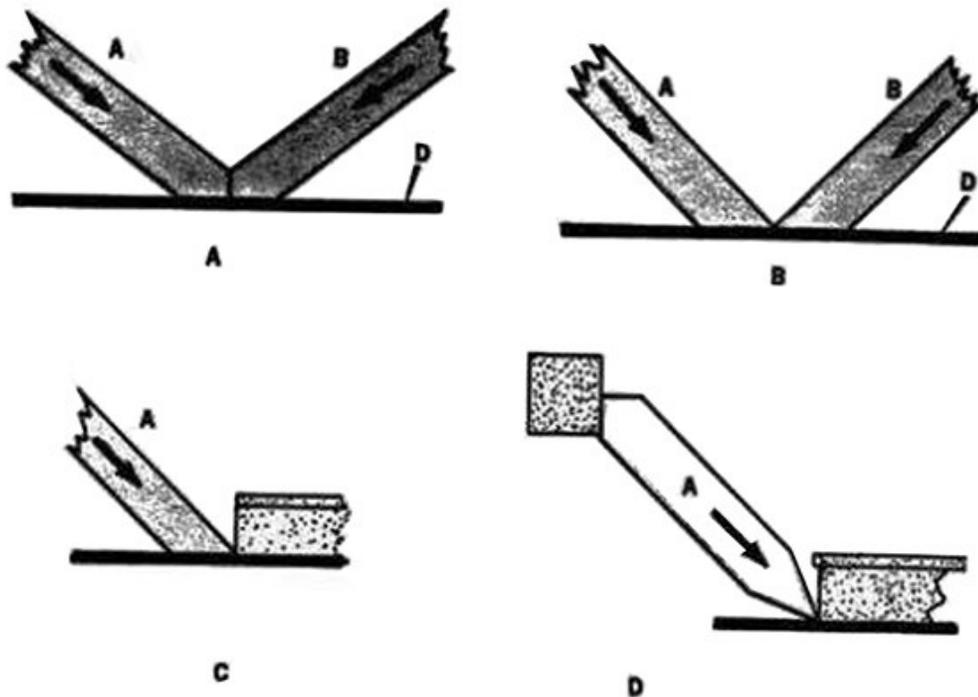


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U.S. Department of Transportation Maritime Administration

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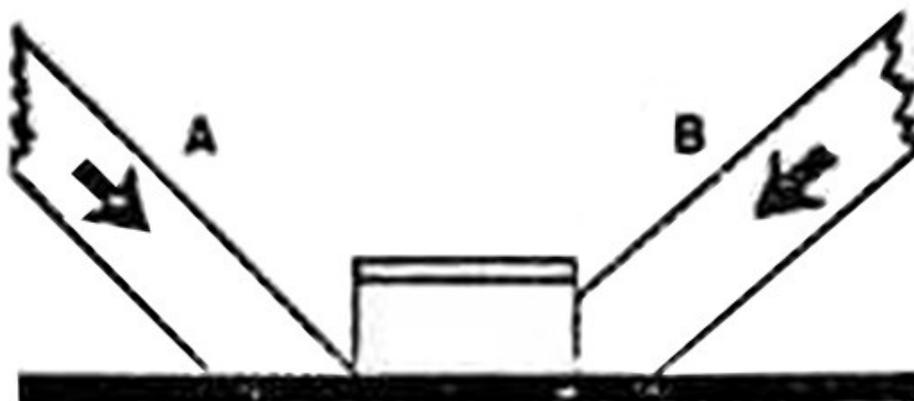


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NAVEDTRA 16191

SF-0018



Adapted for testing purposes only from Damage Controlman
NAVEDTRA 14057

SF-0022



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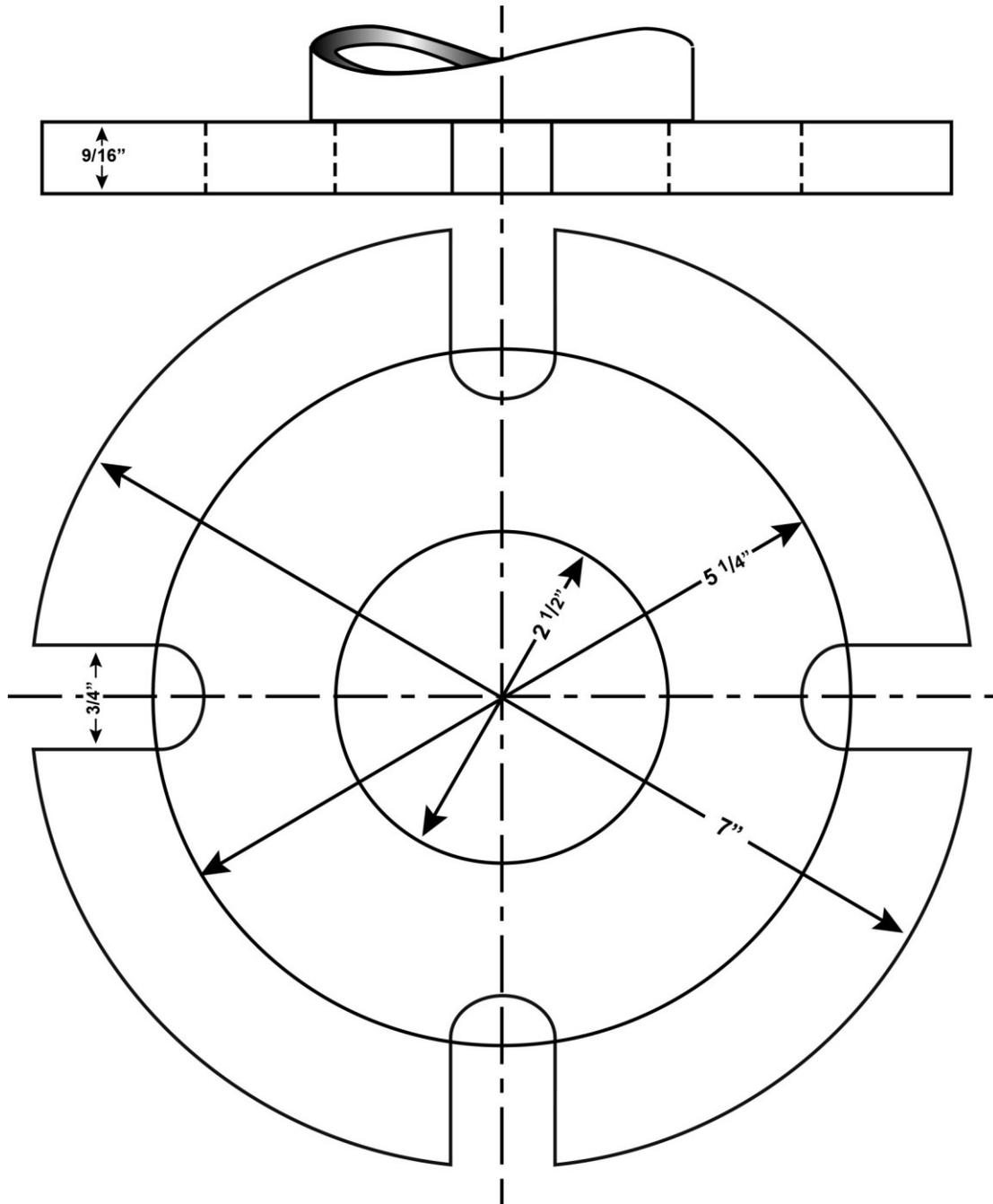
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SF-0028

International Shore Connection



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Combustible Liquids and Other Hazardous Products
CG-174