

U.S.C.G. Merchant Marine Exam

UFIV – Assistant Engineer

Q692 Engineering Safety & Environmental Protection

(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions:

1. Wooden shoring is used in shipboard damage control to _____.
- A. support a damaged bulkhead in position
 - B. force a warped bulkhead back into its normal position
 - C. force a sprung bulkhead back into place
 - D. prevent fractures from spreading

Correct answer: A

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

Correct answer: C

3. An acceptable method of temporarily sealing a crack formed in the hull of a vessel is to _____.
- A. drill holes at each end
 - B. apply a patch of sheet packing backed by a strongback or shoring
 - C. tack weld a doubler plate over the crack
 - D. shore up the crack with welded braces

Correct answer: B

4. Which type of respiratory protection is preferable for the repair/investigation personnel in a hydrogen sulfide (H₂S) environment?
- A. U.S. Navy Oxygen Breathing Apparatus (OBA)
 - B. Emergency Escape Breathing Apparatus (EEBA)
 - C. Positive Self-Contained Breathing Apparatus (SCBA)
 - D. Self-Contained Demand-Type Breathing Apparatus (SCDBA)

Correct answer: C

5. Which of the following limitations is correct regarding gas masks, otherwise called filter masks?
- A. A canister is reliable for up to 5 years from the date of manufacture, as long as the seal is unbroken.
 - B. All canisters must be discarded within 24 hours when the seal becomes broken.
 - C. A maximum of only 30 minutes of protection is afforded with a single canister when in atmospheres containing highly toxic gases.
 - D. All of the above.

Correct answer: A

6. Kapok life jackets require proper care and should NOT be _____.
- A. used as seats, pillows, or footrests
 - B. stowed near open flame or where smoking is permitted
 - C. left on open decks
 - D. all of the above

Correct answer: D

7. 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

Correct answer: C

8. 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

Correct answer: B

9. While retrieving the survival craft, the engine should be stopped _____.
- A. when the craft clears the water
 - B. when the cable has been attached
 - C. on approach to the platform
 - D. at the embarkation

Correct answer: A

10. While adrift in an inflatable life raft in hot, tropical weather _____.
- A. the canopy should be deflated so that it will not block cooling breezes
 - B. the pressure valve may be periodically opened to prevent excessive air pressure
 - C. deflating the floor panels may help to cool personnel
 - D. the entrance curtains should never be opened

Correct answer: C

11. The painter on a rigid life raft must have a length sufficient to reach the highest waterline plus an additional _____.
- A. 5 meters (16 feet)
 - B. 10 meters (31 feet)
 - C. 15 meters (50 feet)
 - D. 20 meters (66 feet)

Correct answer: D

12. Except in rare cases, it is impossible to extinguish a shipboard fire by _____.

- A. Removing the fuel
- B. Removing the heat
- C. Interrupting the chain reaction
- D. Removing the oxygen

Correct answer: A

13. Which of the conditions listed is necessary for a substance to burn?

- A. The temperature of the substance must be equal to or above its fire point
- B. The mixture of vapors with air must be between the LEL and the UEL
- C. The air must contain oxygen in sufficient quantity
- D. All of the above

Correct answer: D

14. The blocking open or absence of fire dampers can contribute to _____.

- A. the accumulation of explosive gases
- B. faster cooling of the fire
- C. the fire spreading by way of the ventilation system
- D. fixed foam systems to be ineffective

Correct answer: C

15. The process that occurs when heat is generated by a chemical reaction within a substance and continues to a point of ignition is known as _____.

- A. chemical ignition
- B. chemical combustion
- C. spontaneous combustion
- D. radiation ignition

Correct answer: C

16. A class "B" fire develops on the weather deck amidships of a moored tank vessel. The fire party should man the _____.

- A. windward monitor and direct the foam onto a vertical surface while standing by with a charged hose to protect the monitor operator with water fog if needed
- B. windward monitor and direct the foam onto a vertical surface while applying water fog to the fire
- C. leeward monitor and direct the foam onto a vertical surface while applying water fog to protect the monitor operator
- D. leeward monitor and direct the foam onto a vertical surface while applying a solid stream of water to wash residual fuel over the side away from the pier

Correct answer: A

17. A fire in a pile of dunnage would be classified as a _____.

- A. class "A"
- B. class "B"
- C. class "C"
- D. class "D"

Correct answer: A

18. 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

Correct answer: C

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

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

Correct answer: A

20. Paints and solvents used aboard a vessel should be _____.

- A. returned to the paint locker after each use
- B. covered with a fine mesh screen to protect from ignition sources
- C. stowed safely at the work site until work is completed
- D. drained into a common container after each use

Correct answer: A

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

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

Correct answer: C

22. 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

Correct answer: C

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

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

Correct answer: B

24. Low velocity water fog is used in firefighting as a _____.

- A. smothering agent
- B. cooling agent
- C. barrier against radiant heat
- D. all of the above

Correct answer: D

25. 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. a wire brush
- C. cornstarch
- D. paint thinner

Correct answer: A

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

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

Correct answer: D

27. If there has been a fire in a closed unventilated compartment it may be unsafe to enter because of _____.

- A. excess nitrogen
- B. unburned carbon particles
- C. excess hydrogen
- D. a lack of oxygen

Correct answer: D

28. When fighting a shipboard fire, crew members securing doorways, hatches, and applying cooling water to adjacent decks and bulkheads, while monitoring the spread of heat and smoke, are setting a _____.

- A. fire boundary
- B. cooling zone
- C. safety perimeter
- D. buffer zone

Correct answer: A

29. When approaching a fire from windward, you should shield firefighters from the fire by using an applicator and _____.

- A. a straight stream of water
- B. low-velocity fog
- C. foam spray
- D. high-velocity fog

Correct answer: B

30. What is the purpose of opening the doors and portholes in figure 2 of the illustration? Illustration SF-0013
- A. To allow water used to fight the fire to flow out of the superstructure
 - B. To keep the hose teams cool
 - C. To provide air flow around the compartment in order to contain the fire
 - D. To allow venting of combustion products from the fire to the atmosphere

Correct answer: D

31. A large fire has developed in the HFO centrifuge room accessed by door "E". To combat the fire you should _____. Illustration SF-0013
- A. Advance the hose team into the room without any additional preparatory action
 - B. Cool adjoining horizontal and vertical surfaces before opening the door to extinguish the fire
 - C. Keep the door tightly closed until all the oil has been consumed by the fire
 - D. Only need to set up a hose team to cool the door, then open the door and extinguish the fire using a type B-II extinguisher

Correct answer: B

32. 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%

Correct answer: C

33. 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

Correct answer: C

34. 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

Correct answer: C

35. If you see an individual fall overboard, what is the FIRST thing you should do?
- A. throw a life ring overboard
 - B. hail "Man Overboard"
 - C. pass the word to the bridge
 - D. sound three prolonged blasts

Correct answer: A

36. The worst atmospheric condition for dispersion of hydrogen sulfide is _____.

- A. nearly calm, clear nights or early morning
- B. full sun with high winds
- C. heavy rain
- D. gusty winds with rain

Correct answer: A

37. The highest concentration of a harmful substance to which a person may be exposed without danger to health, is termed the _____.

- A. threshold limit value
- B. tolerance point
- C. vapor pressure
- D. odor threshold

Correct answer: A

38. The vapors given off by heated fuel oil are flammable, explosive, and _____.

- A. lighter than air
- B. non-toxic
- C. heavier than air
- D. odorless

Correct answer: C

39. Bunker "C" is classified as a grade _____.

- A. "A" liquid
- B. "B" liquid
- C. "E" liquid
- D. "D" liquid

Correct answer: C

40. When checking the level of a volatile liquid in a tank on the weather deck of a tank vessel, you should position yourself _____.

- A. at a right angle to the wind direction
- B. on the leeward side of the opening
- C. on the windward side of the opening
- D. so that the obstruction of your body will protect you from the fumes

Correct answer: A

41. Victual waste is _____.

- A. Any garbage that comes from food or food provisions
- B. The final discharge of sewage treatment plants
- C. The resultant sludge that is collected after water washing a boiler
- D. The final waste product of a manufacturing process

Correct answer: A

42. According to 33 CFR Subchapter O (Pollution), an oceangoing ship of over 400 gross tons must be fitted with a standard discharge shore connection. What size bolt circle diameter is required for this shore connection to transfer oily ballast to a shoreside reception facility?
- A. 125 mm
 - B. 183 mm
 - C. 215 mm
 - D. 250 mm

Correct answer: B

43. In cleaning up an oil spill, the use of straw or reclaimed paper fibers would be an example of which type of oil removal?
- A. Mechanical removal
 - B. Chemical agent removal
 - C. Absorbent removal
 - D. None of the above

Correct answer: C

44. In accordance with 33 CFR Subchapter O (Pollution), which of the following is NOT required to be provided as part of the appendixes of the Shipboard Oil Pollution Emergency Plan?
- A. A list of personnel duty assignments.
 - B. A list which specifies who will be responsible for informing the parties listed and the priority in which they must be notified.
 - C. A list of agencies or officials in regularly visited ports.
 - D. A list of agencies or officials of Coastal State administrations responsible for receiving and processing incident reports.

Correct answer: A

45. 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

Correct answer: C

46. In accordance with 33 CFR Subchapter O (Pollution), each operation involving the transfer of oil or oily mixture that requires an entry in the Oil Record Book shall be fully recorded _____.
- A. Within 24 hours of completion of the project
 - B. Within 48 hours of completion of the operation
 - C. Without delay
 - D. Within 12 hours of completion of the operation

Correct answer: C

47. Which extinguishing agent is the best for use on electrical fires?

- A. CO₂
- B. Water fog
- C. Dry chemical
- D. Foam

Correct answer: A

48. In the absence of external forces, the center of gravity of a floating vessel is located directly above the _____.

- A. geometric center of the displaced volume
- B. amidships
- C. metacenter
- D. center of flotation

Correct answer: A

49. If the cause of severe list or trim of a vessel is due to off-center ballast, counter-flooding into empty tanks will _____.

- A. decrease list or trim
- B. increase the righting arm
- C. increase the righting moment
- D. increase list or trim

Correct answer: A

50. If additional weight is placed on the main deck of the vessel shown in the illustration _____.
Illustration SF-0023

- A. KB will go down
- B. GM will increase
- C. G will rise
- D. K will rise

Correct answer: C

SF-0013

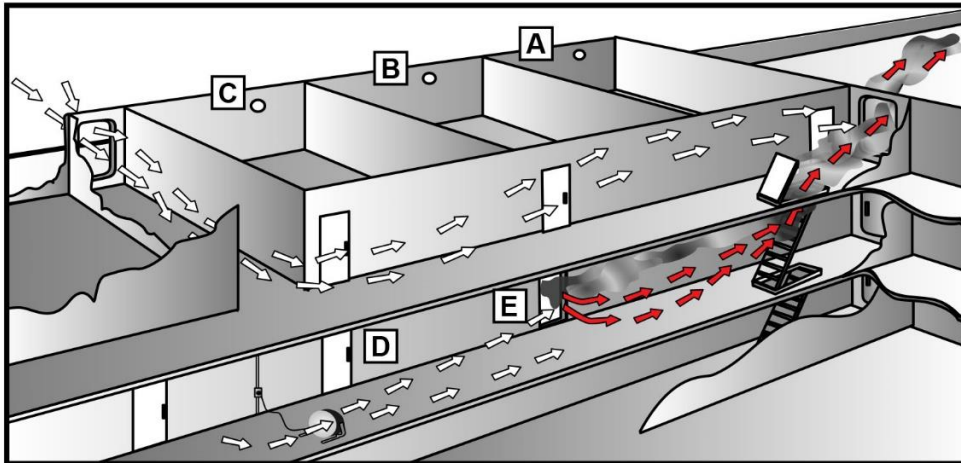


Figure 1

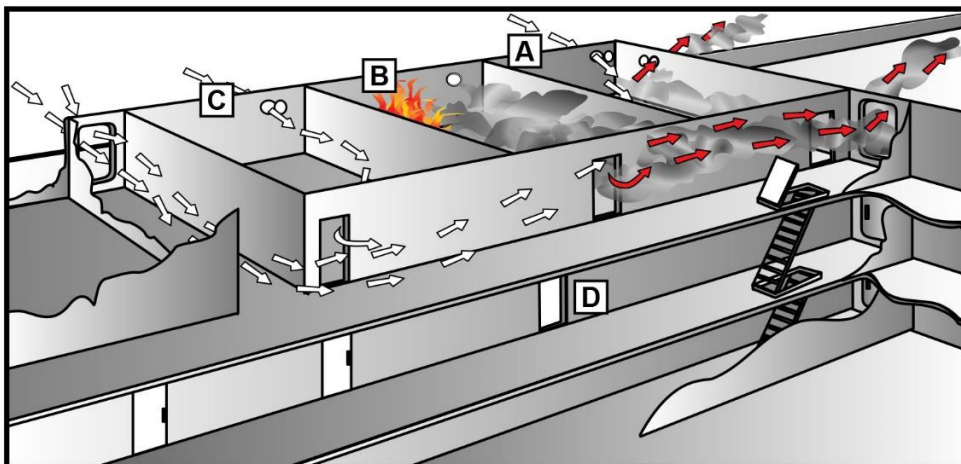


Figure 2

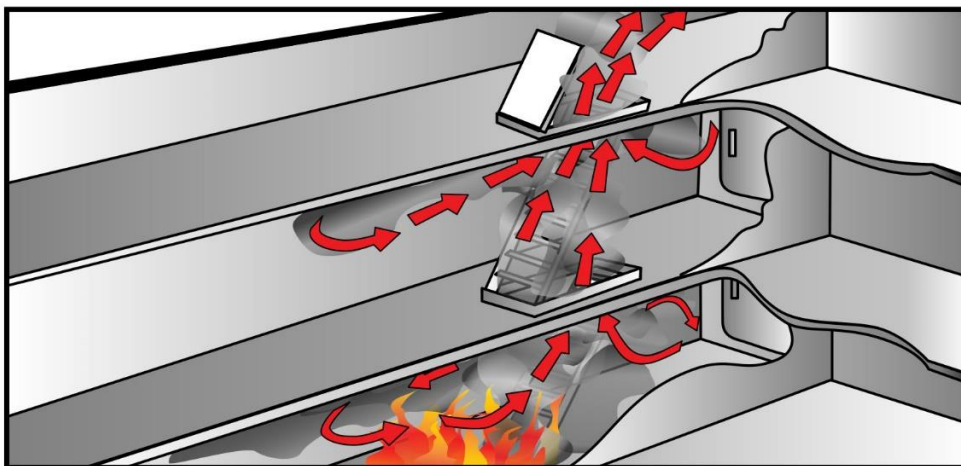
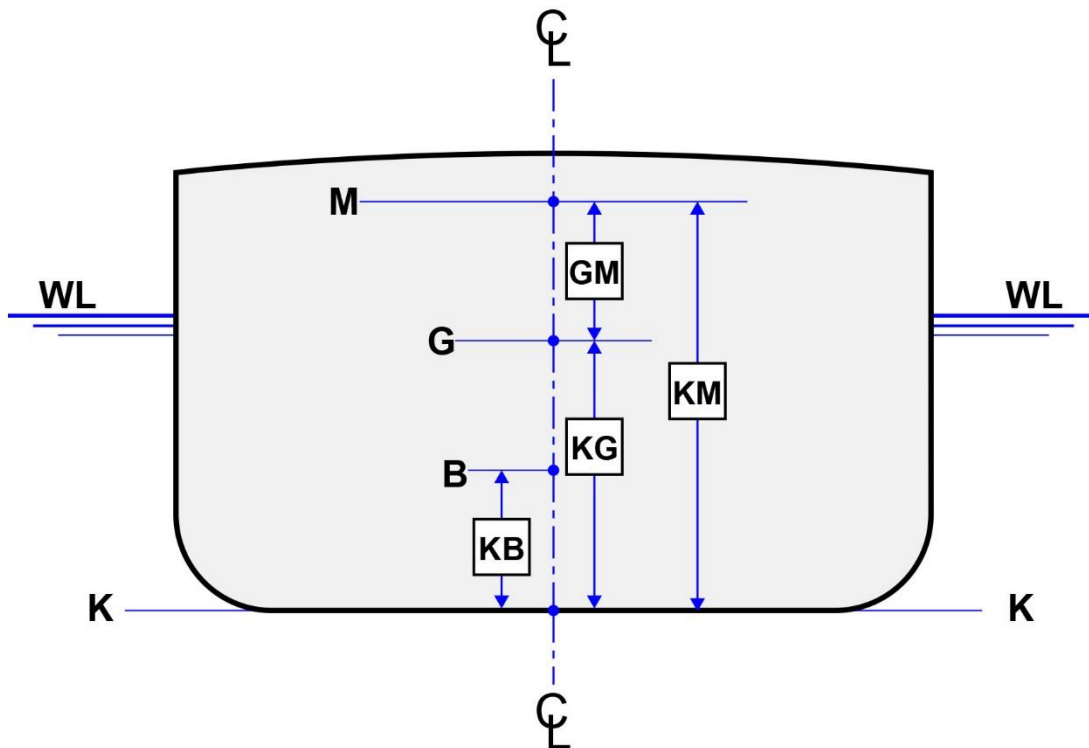


Figure 3

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SF-0023

Stability Calculations



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