

U.S.C.G. Merchant Marine Exam

DDE – 1000/4000 HP

Q633 Engineering Safety & Environmental Protection

(Sample Examination)

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

1. A flat block placed under the end of a shore for the purpose of distributing pressure is referred to as a _____.
- A. butt piece
 - B. shole
 - C. strongback
 - D. shore foot

Correct answer: B

2. 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

Correct answer: D

3. Progressive flooding in the engine room may be minimized by securing watertight boundaries and _____.
- A. dumping fuel oil
 - B. evacuating the engine room
 - C. pumping out flooded compartments
 - D. transferring reserve feedwater

Correct answer: C

4. Which of the devices listed would be safe to use in a compartment with insufficient oxygen?
- A. Canister type mask
 - B. Self-contained breathing apparatus
 - C. Wet handkerchief
 - D. Dust or gas mask

Correct answer: B

5. 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

6. 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

Correct answer: D

7. Which of the following statements is true concerning an immersion suit and its use?
- A. Only a light layer of clothing may be worn underneath.
 - B. They provide sufficient flotation to do away with the necessity of wearing a life jacket.
 - C. They should be tight fitting.
 - D. A tear in the suit will not appreciably reduce its value.

Correct answer: B

8. When collecting condensation for drinking water, _____.
- A. a sponge used to mop up and store condensation must be kept salt free
 - B. only condensation on the bottom of the canopy should be collected
 - C. it should be strained through a finely woven cloth
 - D. chlorine tablets should be used to make it drinkable

Correct answer: A

9. The canopy of your life raft should _____.
- A. go into place as the raft is inflated
 - B. be put up after everyone is aboard
 - C. be put up only in severe weather
 - D. be used as a sail if the wind is blowing

Correct answer: A

10. The purpose of the wire stretched between the lifeboat davit heads is to _____.
- A. keep the movement of the davits at the same speed
 - B. keep the davits from slipping when they are in the stowed position
 - C. prevent vibration during lowering of the boat
 - D. support the manropes

Correct answer: D

11. Which of the following statements is true concerning carbon dioxide when used as a fire extinguishing agent?
- A. Carbon dioxide should be applied slowly to a large engine room fire.
 - B. Carbon dioxide is corrosive when exposed to fire.
 - C. Its smothering effect is excellent for class "B" fires.
 - D. Its total cooling effect is far greater than water.

Correct answer: C

12. The advantage of using a dry chemical fire extinguishing agent is _____.

- A. its good stability and non-toxicity
- B. permanent extinguishment regardless of the reignition sources
- C. its excellent cooling ability
- D. all of the above

Correct answer: A

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

- A. If applied promptly
- B. If applied in connection with foam
- C. To prevent rekindling
- D. If attempts to extinguish the fire with low velocity fog have failed

Correct answer: A

14. 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

Correct answer: C

15. 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. cornstarch
- D. a wire brush

Correct answer: A

16. A low velocity fog applicator is retained in an all-purpose nozzle by a bayonet joint. The applicator is prevented from rotating in the joint by _____.

- A. water pressure
- B. a locknut
- C. a keeper screw
- D. a spring-loaded catch

Correct answer: D

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

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

Correct answer: B

18. 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

19. The most effective method of extinguishing a class "A" fire is by _____.

- A. blanketing and smothering
- B. using non-conducting extinguishers
- C. using a sodium based dry chemical
- D. quenching and cooling

Correct answer: D

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

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

Correct answer: C

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

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

Correct answer: D

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

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

Correct answer: C

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

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

Correct answer: D

24. The reading of a combustible gas indicator indicates the percentage of the _____.

- A. Concentration by weight of nonflammable gas in a compartment
- B. Concentration of flammable gas in a compartment
- C. Upper explosive limit of a flammable gas concentration
- D. Lower explosive limit of a flammable gas concentration

Correct answer: D

25. If flammable vapors have penetrated a gas free space, which of the following actions would be the most hazardous to perform?

- A. Opening switches in the space to de-energize circuits
- B. Closing switches adjacent to the space to operate vent fans
- C. Leaving electrical circuits energized in the space
- D. Securing all power to the space from a remote location

Correct answer: A

26. In accordance with 33 CFR Subchapter O, the term "discharge", as it applies to the pollution regulations, means _____.

- A. Dumping
- B. Spilling
- C. Leaking
- D. All of the above

Correct answer: D

27. In accordance with 46 CFR Subchapter H (Passenger Vessels), which of the following statements is true regarding sprinkler heads which are normally activated by the melting of a fusible link?

- A. Sprinkler heads installed in the galley would have a higher melting point fusible link than those installed in the living spaces.
- B. Sprinkler heads installed in the galley and living spaces would have the same fusible link melting point.
- C. Sprinkler heads installed in the living spaces would have a higher melting point fusible link than those installed in the galley.
- D. None of the above; sprinkler heads with fusible links are prohibited aboard U.S. flag vessels.

Correct answer: A

28. When the scuppers are plugged and an oil spill occurs on deck, you should _____.

- A. use absorbent material, such as sawdust, to clean up the spill
- B. remove plugs from scuppers to allow the spill to run overboard and wipe the area dry with rags
- C. remove plugs from scuppers and wash the fuel overboard with a solvent
- D. remove plugs from scuppers and wash fuel overboard with water

Correct answer: A

29. Why is it important for double bottom fuel oil tanks not to be topped off when loading fuel at cold temperatures?
- A. A temperature rise of the fuel will cause an overflow from the tank vent.
 - B. Fueling valve may become stuck closed and cause the fuel oil to spill before the valve can be opened.
 - C. Air pockets may cause the fuel to bubble out of the ullage hole.
 - D. Increased viscosity of the product needs higher loading pressure, which increases the chances of a spill.

Correct answer: A

30. 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

Correct answer: A

31. Which of the listed classes of fire would most likely occur in the engine room of a vessel?
- A. Classes "A" and "B"
 - B. Classes "B" and "C"
 - C. Classes "C" and "D"
 - D. Classes "A" and "D"

Correct answer: B

32. To fight a class "C" fire, you should use carbon dioxide or _____.
- A. mechanical foam
 - B. dry chemical
 - C. chemical foam
 - D. chemically treated saw dust

Correct answer: B

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

Correct answer: A

34. 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

Correct answer: D

35. 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

Correct answer: B

36. 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

37. 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. drained into a common container after each use
 - D. stowed safely at the work site until work is completed

Correct answer: A

38. A ship's low-pressure CO₂ fixed fire extinguishing system is normally designed for a storage tank pressure and temperature of approximately _____.
- A. 14.7 psia and 0 degrees Fahrenheit
 - B. 150 psig and 72 degrees Fahrenheit
 - C. 300 psig and 0 degrees Fahrenheit
 - D. 1500 psig and 72 degrees Fahrenheit

Correct answer: C

39. In a typical automatic fire alarm system, all zone circuits are always connected _____.
- A. to the trouble alarm supervising resistor
 - B. in parallel
 - C. in series
 - D. to the detecting cabinet

Correct answer: D

40. If the cause of severe list or trim of a vessel is due to off-center ballast, counter-flooding into empty tanks will _____.
- A. increase the righting moment
 - B. increase list or trim
 - C. decrease list or trim
 - D. increase the righting arm

Correct answer: C

41. The weight of the liquid displaced by a vessel floating in sea water is equal to the _____.
- A. weight required to sink the vessel
 - B. displaced submerged volume
 - C. total weight of the vessel
 - D. reserve buoyancy

Correct answer: C

42. If additional weight is placed on the main deck of the vessel shown in the illustration _____.
Illustration SF-0023
- A. GM will increase
 - B. G will rise
 - C. KB will go down
 - D. K will rise

Correct answer: B

43. In the absence of external forces, adding weight to one side of a floating vessel, will cause the vessel to _____.
- A. list until the center of buoyancy is aligned vertically with the center of gravity
 - B. heel until the angle of loll is reached
 - C. trim to the side opposite TCG until all moments are equal
 - D. decrease draft at the center of flotation

Correct answer: A

44. The important stability parameter "KG" is defined as the _____.
- A. Height of the center of buoyancy above the keel
 - B. Metacentric height
 - C. Height of the metacenter above the keel
 - D. Height of the center of gravity above the keel

Correct answer: D

45. When preparing to pump flammable liquids with a centrifugal pump, you should _____.
- A. draw a small quantity of liquid to prime the pump
 - B. have a standby pump running with the discharge valve closed
 - C. lift the relief valve by hand to check its operation
 - D. check for gland leakage and any fire hazard

Correct answer: D

46. When pumping sour crude, which gas should be tested for prior to entering the cargo pumproom to repair a leaking pump?
- A. Benzene
 - B. Carbon monoxide
 - C. Hydrogen sulfide
 - D. Tetraethyl lead

Correct answer: C

47. What information can be obtained from a marine chemist's certificate on a tank barge?
- A. The barge's stability information
 - B. The quality of the barge's cargo
 - C. The number of fire extinguishers required onboard
 - D. The tanks which are safe to enter when the certificate was issued

Correct answer: D

48. 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. Safety Data Sheet
 - C. Hazardous Chemical Loading Document
 - D. Hazardous Chemical Information Sheet

Correct answer: B

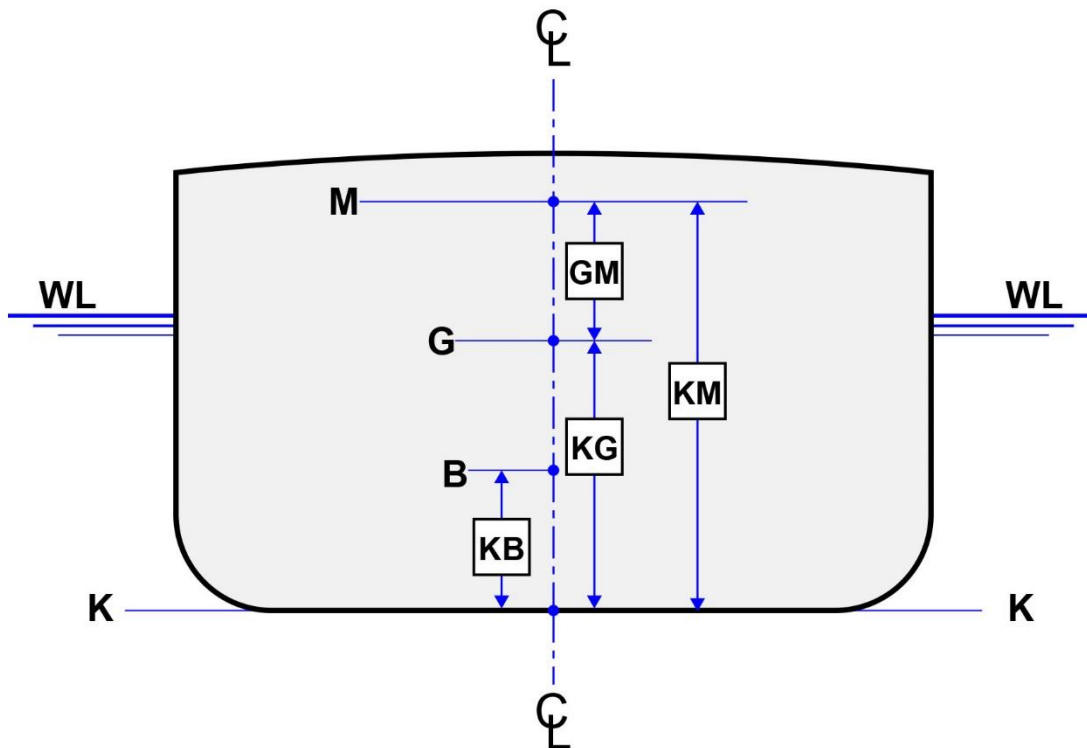
49. According to 33 CFR Subchapter O (Pollution), an oceangoing ship of over 400 gross tons must be fitted with a standard discharge shore connection. What size bolt circle diameter is required for this shore connection to transfer oily ballast to a shoreside reception facility?
- A. 125 mm
 - B. 183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

Correct answer: B

50. If an incorrect entry were made in the Oil Record Book, you should _____.
- A. draw a single line through the wrong entry and initial it
 - B. notify the ship's officer in charge
 - C. erase the entry and rewrite it
 - D. completely black it out and make the correct entry alongside

Correct answer: A

SF-0023 Stability Calculations



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