



Advanced Training for Liquefied Gas Tanker Cargo Operations (GASCO)

30 Practice Questions and Answers for STCW Exams

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Practice Set 1

Q1. What is the primary component of Liquefied Natural Gas (LNG)?

- A) Methane
- B) Butane
- C) Propane
- D) Ethane

Correct Answer: A (Methane)

Explanation: LNG consists predominantly of methane (typically over 85-95%) along with small percentages of ethane, propane, and butane.

Q2. At atmospheric pressure, what is the approximate boiling point of methane?

- A) 42 degreesC
- B) 104 degreesC
- C) 0 degreesC
- D) 162 degreesC

Correct Answer: D (162 degreesC)

Explanation: Methane boils at approximately -161.5 degreesC (-162 degreesC) under standard atmospheric pressure.

Q3. Which code governs the construction and equipment of ships carrying liquefied gases in bulk?

- A) IGC Code
- B) IMSBC Code
- C) IMDG Code
- D) IBC Code

Correct Answer: A (IGC Code)

Explanation: The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) is mandatory under SOLAS Chapter VII.

Q4. What is the function of Boil-Off Gas (BOG) on an LNG carrier?

- A) It is dumped directly into seawater
- B) It must be vented continuously into the atmosphere
- C) It is used to extinguish boiler fires
- D) It is generated due to heat ingress and can be used as fuel or re-liquefied

Correct Answer: D (It is generated due to heat ingress and can be used as fuel or re-liquefied)

Explanation: Boil-Off Gas (BOG) forms when cargo absorbs ambient heat. Modern gas carriers use BOG in dual-fuel propulsion engines or re-liquefy it back into the cargo tanks.



- A) Dry Nitrogen or Inert Gas with low O₂
- B) Oxygen
- C) Compressed air
- D) Carbon Dioxide only

Correct Answer: A (Dry Nitrogen or Inert Gas with low O₂)

Explanation: Nitrogen gas or dry inert gas (O₂ < 5%) is used to displace oxygen from cargo tanks to prevent flammable atmosphere formation.

Q6. What is the Maximum Allowable Relief Valve Setting (MARVS) for a Type C independent tank on an LPG carrier?

- A) Always negative pressure
- B) Exactly 0.0 bar gauge
- C) Less than 0.1 bar gauge
- D) Greater than 0.7 bar gauge

Correct Answer: D (Greater than 0.7 bar gauge)

Explanation: Type C independent tanks are pressure vessels designed for MARVS usually greater than 0.7 bar gauge (typically 5 to 18 bar gauge for fully pressurized tanks).

Q7. What risk is associated with rapid liquid cargo release onto steel deck structures?

- A) Steel expansion and warping
- B) Brittle fracture of hull steel due to extreme cold
- C) Corrosion of hull plates
- D) Immediate magnetic interference

Correct Answer: B (Brittle fracture of hull steel due to extreme cold)

Explanation: Cryogenic liquids cause severe localized thermal shock and brittle fracture in normal ship steel. Water curtains and deck protection are used.

Q8. What type of pumps are most commonly used submerged inside LNG cargo tanks?

- A) Steam reciprocating pumps
- B) Screw positive displacement pumps
- C) Submerged electric motor driven centrifugal pumps
- D) Diaphragm hand pumps

Correct Answer: C (Submerged electric motor driven centrifugal pumps)

Explanation: Submerged motor centrifugal pumps operate directly submerged in LNG liquid, as methane is electrical insulation in liquid phase with zero oxygen.

Q9. What instrument measures low concentration flammable gas by catalytic oxidation?

- A) Explosimeter (Combustible Gas Indicator)
- B) Hydrometer
- C) Paramagnetic Oxygen Analyzer
- D) Hygrometer

Correct Answer: A (Explosimeter (Combustible Gas Indicator))

Explanation: Explosimeters measure flammable vapor concentrations as a percentage of the Lower Explosive Limit (LEL).



- A) Quick Release Towing Hook
- B) Auto-ignition Override
- C) Manual Bilge Injection
- D) Emergency Shutdown System (ESD)

Correct Answer: D (Emergency Shutdown System (ESD))

Explanation: The Emergency Shutdown (ESD) system stops cargo pumps, closes ESD valves, and isolates cargo transfer in emergency situations.

Q11. Under STCW Code Table A-V/1-2-2, what is the mandatory requirement regarding regulatory compliance and STCW code requirements during Advanced Liquefied Gas Tanker operations?

- A) Applicable only during drydock operations
- B) Strict compliance with approved safety procedures and flag state regulations
- C) Verbal recommendation without documentation
- D) Optional adherence based on vessel size

Correct Answer: B (Strict compliance with approved safety procedures and flag state regulations)

Explanation: STCW Code Table A-V/1-2-2 mandates strict compliance with approved safety protocols for Advanced Liquefied Gas Tanker.

Q12. What specific safety precaution must be observed when managing regulatory compliance and STCW code requirements for Advanced Liquefied Gas Tanker on board?

- A) Conducting a thorough risk assessment and briefing all involved personnel prior to starting work
- B) Proceeding without informing the officer on watch
- C) Delegating tasks exclusively to untrained crew members
- D) Disabling automated safety alarms to save time

Correct Answer: A (Conducting a thorough risk assessment and briefing all involved personnel prior to starting work)

Explanation: Risk assessments and pre-job briefings ensure all team members understand hazards during Advanced Liquefied Gas Tanker operations.

Q13. What is 'rollover' in an LNG cargo tank?

- A) Over-rotation of the submerged pump impeller
- B) Rapid mixing of two stratified liquid layers of different densities leading to sudden high gas evolution
- C) Physical capsizing of the ship
- D) Sloshing of cargo causing physical tank deformation

Correct Answer: B (Rapid mixing of two stratified liquid layers of different densities leading to sudden high gas evolution)

Explanation: Rollover occurs when stratified LNG layers equalize densities rapidly, releasing large volumes of boil-off gas and causing sharp tank pressure rise.

Q14. What is the primary hazard of Ammonia (NH₃) when carried on gas tankers?

- A) Non-flammable under all temperature conditions
- B) High toxicity, corrosive nature, and stress corrosion cracking in steel
- C) Zero toxicity and inert behavior
- D) High radio-activity

Correct Answer: B (High toxicity, corrosive nature, and stress corrosion cracking in steel)

Explanation: Ammonia is toxic, corrosive to copper alloys, and can cause stress corrosion cracking (SCC) in carbon-manganese



Q15. What insulation material is widely used in LNG membrane tanks?

- A) Reinforced Polyurethane Foam (R-PUF) and Plywood Boxes with Perlite
- B) Solid lead sheets
- C) Fiber glass wool only
- D) Concrete slabs

Correct Answer: A (Reinforced Polyurethane Foam (R-PUF) and Plywood Boxes with Perlite)

Explanation: GTT No.96 uses perlite-filled plywood boxes, while Mark III uses reinforced polyurethane foam insulation panels.

Q16. What is the function of the water spray system on a gas carrier upper deck?

- A) Clean the deck paintwork
- B) Provide fresh drinking water to crew
- C) Cool cargo tank domes, accommodation boundaries, and absorb toxic or flammable gas leaks
- D) Lubricate cargo manifold connections

Correct Answer: C (Cool cargo tank domes, accommodation boundaries, and absorb toxic or flammable gas leaks)

Explanation: Deck water spray systems cool structural steel boundaries and knock down soluble gas clouds (like ammonia) during emergency leaks.

Q17. Before gas-freeing a cargo tank that contained flammable gas, what step must be taken first?

- A) Turn on electric deck heaters
- B) Open all deck hatches immediately to fresh air
- C) Inert the tank with Nitrogen or inert gas until hydrocarbon content is below LFL
- D) Fill the tank with sea water

Correct Answer: C (Inert the tank with Nitrogen or inert gas until hydrocarbon content is below LFL)

Explanation: Purging flammable gas with inert gas prevents the atmosphere inside the tank from entering the flammable range when fresh air is later introduced.

Q18. What is the purpose of the primary membrane in a Gaztransport membrane LNG containment system?

- A) Liquid-tight barrier containing the cargo liquid
- B) Outer weather deck protection
- C) Thermal insulation layer only
- D) Structural hull stiffener

Correct Answer: A (Liquid-tight barrier containing the cargo liquid)

Explanation: The primary membrane (Invar steel or corrugated stainless steel) acts as a thin liquid-tight liquid container.

Q19. What device is installed on gas carrier vents to prevent flame propagation into cargo tanks?

- A) Orifice plate
- B) Flame screen or flame arrestor
- C) Butterfly valve
- D) Non-return flap

Correct Answer: B (Flame screen or flame arrestor)

Explanation: Flame screens use wire gauze to dissipate heat and prevent external flames from entering gas outlets.



- A) Monitoring crew cabin temperature
- B) Tracking ship GPS position
- C) Calculating engine oil consumption
- D) Accurately measuring cargo volume, temperature, and pressure for financial transfer

Correct Answer: D (Accurately measuring cargo volume, temperature, and pressure for financial transfer)

Explanation: CTMS measures liquid level, density, and temperature with high precision for cargo accounting and commercial billing.

Q21. What is the upper explosive limit (UEL) of methane in air?

- A) Approximately 90%
- B) Approximately 5%
- C) Approximately 50%
- D) Approximately 15%

Correct Answer: D (Approximately 15%)

Explanation: Methane is flammable in air between its LEL of ~5% and UEL of ~15% by volume.

Q22. What personal protective equipment must be worn when sampling toxic liquefied gases?

- A) Dust mask and safety shoes
- B) Standard cotton coveralls only
- C) Sunglasses and leather gloves
- D) Full protective suit, SCBA or air-line respirator, and chemical-resistant gloves

Correct Answer: D (Full protective suit, SCBA or air-line respirator, and chemical-resistant gloves)

Explanation: Handling or sampling toxic gases requires respiratory protection (SCBA) and chemical-proof suits to prevent inhalation or contact.

Q23. Which international regulation specifies the minimum standard for regulatory compliance and STCW code requirements concerning Advanced Liquefied Gas Tanker?

- A) STCW Code Section A-V/1-2-2 and relevant SOLAS/MARPOL conventions
- B) Tonnage Measurement Convention 1969
- C) Port State Control advisory note only
- D) International Load Line Certificate Annex 3

Correct Answer: A (STCW Code Section A-V/1-2-2 and relevant SOLAS/MARPOL conventions)

Explanation: STCW Code Section A-V/1-2-2 sets international standards for training and operational competency in Advanced Liquefied Gas Tanker.

Q24. In the event of an emergency involving regulatory compliance and STCW code requirements during Advanced Liquefied Gas Tanker tasks, what immediate action is required?

- A) Raise the alarm, notify the Officer of the Watch, and execute assigned muster list duties
- B) Attempt to resolve the incident silently without raising the alarm
- C) Wait until the end of the watch to log the issue
- D) Evacuate the vessel immediately without informing the bridge

Correct Answer: A (Raise the alarm, notify the Officer of the Watch, and execute assigned muster list duties)

Explanation: Prompt alarm activation ensures emergency response teams can mobilize immediately.



- A) Liquefied Petroleum Gas
- B) Liquefied Propylene Gasoline
- C) Low Pressure Gas
- D) Liquid Processed Gas

Correct Answer: A (Liquefied Petroleum Gas)

Explanation: LPG stands for Liquefied Petroleum Gas, primarily consisting of propane and butane mixtures.

Q26. In a fully refrigerated LPG carrier, at what temperature is propane typically carried at atmospheric pressure?

- A) +15 degreesC
- B) 42 degreesC
- C) 5 degreesC
- D) 162 degreesC

Correct Answer: B (42 degreesC)

Explanation: Commercial propane boils at -42.1 degreesC at atmospheric pressure, making fully refrigerated LPG storage around -42 degreesC.

Q27. What gas detection method is used in continuous gas monitoring systems in interbarrier spaces?

- A) Infrared gas absorption analyzers
- B) Litmus paper strips
- C) Visual observation glass
- D) Smoke detectors

Correct Answer: A (Infrared gas absorption analyzers)

Explanation: Infrared gas detectors provide reliable continuous detection of hydrocarbon vapors without needing oxygen.

Q28. What is the function of the secondary barrier in an LNG containment system?

- A) Prevent seawater entry into ballast tanks
- B) Provide structural strength to the main deck
- C) Hold engine exhaust gas
- D) Contain cargo leakage for a specified period if the primary barrier fails

Correct Answer: D (Contain cargo leakage for a specified period if the primary barrier fails)

Explanation: Under the IGC Code, a secondary barrier prevents cold liquid reaching the ship hull structure if the primary barrier leaks.

Q29. Why must cargo tanks be cooled down gradually before loading cryogenic liquid cargo?

- A) Increase loading speed
- B) Save electrical power
- C) Prevent rust formation
- D) Prevent excessive thermal stress and deformation of tank structure and pumps

Correct Answer: D (Prevent excessive thermal stress and deformation of tank structure and pumps)

Explanation: Controlled tank cool-down limits thermal gradients, avoiding structural cracks or seal damages in tanks and piping.



Q30. What is the typical maximum oxygen content allowed in Nitrogen used for inerting gas tanks?

- A) 8.0% by volume
- B) 0.5% to 1.0% by volume
- C) 15.0% by volume
- D) 21.0% by volume

Correct Answer: B (0.5% to 1.0% by volume)

Explanation: High purity Nitrogen generators on gas tankers supply N2 with O2 levels below 0.5-1% to ensure complete safety.