1. The standard unit of liquid volume used in the petroleum industry, as well as the tanker industry, is a ____.  
   A. barrel  
   B. drum  
   C. gallon  
   D. liter

2. The fitting at the end of a cargo line in a tank that allows suction to be taken close to the bottom of a tank is a __________.  
   A. suction end  
   B. strainer  
   C. bell-mouth  
   D. vacuum valve

3. The main underdeck pipeline on a tankship is connected to individual tanks by __________.  
   A. tank drops  
   B. line drops  
   C. crossovers  
   D. branch lines

4. The pipe used to connect two separate piping systems on a tank vessel is known as a __________.  
   A. crossover  
   B. transfer  
   C. connection  
   D. junction

5. The system of valves and cargo lines in the bottom piping network of a tank vessel that connects one section of cargo tanks to another section is called a __________.  
   A. crossover  
   B. runaround  
   C. come-along  
   D. manifold

6. What will NOT increase friction of a liquid flowing in a pipe and cause a loss of suction head?  
   A. Bends in the piping  
   B. Slowing the pumping rate  
   C. Pipeline valves  
   D. Backing rings for pipe welds

7. The piping that routes an oil cargo from the manifold to underdeck pipelines is known as a __________.  
   A. cargo fill  
   B. line drop  
   C. transfer  
   D. branch line

8. The piping that routes an oil cargo from the manifold directly to a cargo tank and serves only one tank is known as a __________.  
   A. cargo fill  
   B. filler line  
   C. tank drop  
   D. branch line

9. Before a tank is to be crude oil washed, the oxygen content in the tank must be measured at a position __________.  
   A. immediately above the level of the oil  
   B. at the top of the tank  
   C. in the vent riser  
   D. one meter from the deck

10. The complete details of a crude oil washing system aboard your vessel, including the operating sequences and procedures, design characteristics, a description of the system, and required personnel will be found in the __________.  
    A. Oil Transfer Procedures Manual  
    B. Crude Oil Washing Operations and Equipment Manual  
    C. Code of Federal Regulations  
    D. Crude Oil Washing addendum to the Certificate of Inspection
11  1475  Ref: Tankers, COW  
What is NOT a requirement for the safe and effective use of a crude oil washing system?
A. Strip all tanks and remove the bottom residue.
B. Use an inert gas system while washing tanks.
C. Use portable washing machines to reach areas obscured by structural members in the tanks.
D. Decant one meter from the source tank for the tank cleaning machines.

12  2350  Ref: Tankers, COW  
You are planning to use a crude oil washing system. What precaution must be taken with the source tank for the washing machines?
A. At least one meter must be decanted from the source tank.
B. The oil in the source tank must be sampled for compatibility.
C. The source tank must have been crude oil washed at least once in the past 150 days.
D. The inert gas system must lower the oxygen content in the source tank to a maximum of 12%.

13  2351  Ref: Tankers, COW  
You are planning to use the crude oil washing system on your tankship. What is required to prevent electrostatic buildup in the tanks?
A. The portable machines must be set at the proper drop for the first wash before the fixed machines are used.
B. The source tank for the tank cleaning machines must have least one meter decanted from it.
C. The inert gas system must reduce the oxygen content in the tanks to a maximum of 18%.
D. The fixed machines must be operated simultaneously with the portable machines to equalize the electrostatic potential.

14  2442  Ref: Tankers, COW  
You have completed a crude oil wash. What action should be taken with the oil in the lines running to the washing machines?
A. Open a COW nozzle forward and one aft and drain the line into the after tank by gravity
B. Blow the line out using compressed air
C. Pull a suction using the supply line pump
D. Close off all valves in the system and leave the oil in the line primed for the next crude oil wash

15  506  Ref: Tankers, Flame Screens  
Flame screens are used to __________.
A. contain flammable fumes
B. protect firefighters from flames
C. prevent flames from entering tanks
D. keep flames and sparks from getting out of an engine's exhaust system

16  1667  Ref: Tankers, Hazardous Cargo  
When carrying a cargo of asphalt or molten sulfur, which are carried at temperatures of over 300°F, one of the biggest dangers is __________.
A. water in the tanks or pipelines
B. having the cargo too cool
C. explosion of vapors after discharge
D. inadequate ullage space

17  1987  Ref: Tankers, Measurement, Innage  
Which refers to the depth of a petroleum product in a tank?
A. Outage  C. Thievage
B. Ullage  D. Innage

18  718  Ref: Tankers, Measurement, Thieving  
Litmus paste is used in order to determine __________.
A. innage  C. ullage
B. thievage  D. the tank's datum point
19 Ref: Tankers, Measurement, Thieving
What is meant by “thieving” a petroleum cargo?
A. Siphoning off a few barrels of petroleum for shipboard use
B. Determining the amount of water (if any) in each cargo tank
C. Adjusting the cargo figures to coincide with the draft
D. Reducing the gross cargo calculations to net amounts

20 Ref: Tankers, Measurement, Ullages
The distance between the surface of the liquid and the tank top in a cargo tank is called _________.
A. thievage C. ullage
B. innage D. tankage

21 Ref: Tankers, Measurement, Ullages
Ullage measurements are taken from the top of the liquid to __________.
A. the base of the expansion trunk
B. the base of the ullage port
C. a line scribed within the ullage port
D. an above-deck datum, usually the top of the ullage hole

22 Ref: Tankers, Oil, Samples
Oil product samples should be taken from the __________.
A. dock riser C. shore tank discharge
B. ship’s cargo tanks D. All of the above

23 Ref: Tankers, Oil, Sour Crude
Sour crude oil __________.
A. contains high quantities of hydrogen sulfide C. is lighter than other crudes
B. is diluted with other products for carriage D. is less hazardous to load than other crudes

24 Ref: Tankers, Oily Water Separator
In controlling pollution, which action should be taken after all dirty ballast has been transferred to the slop tank and prior to discharge through the oily water separator?
A. The clean tanks should be ballasted.
B. The slops should be allowed time to settle.
C. Chemicals should be added to emulsify the oil.
D. The dirty ballast tank is crude oil washed.

25 Ref: Tankers, Pump, Booster
The terminal indicates to you that they are going to use a booster pump to assist the discharging operation. You start the discharge, and in a few minutes the pressure drops sharply. This could be a result of the __________.
A. booster pump coming on the line and discharging properly
B. booster pump failing to start
C. booster pump being lined up in the wrong direction
D. ship’s pump speeding up

26 Ref: Tankers, Pump, Centrifugal
All of the following steps are taken in starting a centrifugal pump, EXCEPT to __________.
A. set the relief valve C. vent the pump casing
B. check the lubrication system D. open the pump suction and discharge valves

27 Ref: Tankers, Pump, Centrifugal
Centrifugal pumps have what advantage(s) over reciprocating pumps?
A. They are less expensive. C. They pump more cargo in less time.
B. They are smaller for equivalent pumping ability. D. All of the above
28 1437 Ref: Tankers, Pump, Centrifugal
What is a characteristic of all centrifugal cargo pumps?
A. They are self-priming.
B. Decreasing the speed of rotation will decrease the discharge pressure.
C. Opening the discharge valve wider will increase the discharge pressure.
D. All of the above

29 1457 Ref: Tankers, Pump, Centrifugal
What is LEAST likely to be used to strip a cargo tank?
A. Centrifugal pump
B. Eductor
C. Rotary pump
D. Reciprocating pump

30 1479 Ref: Tankers, Pump, Centrifugal
What is NOT an advantage of centrifugal pumps over reciprocating pumps?
A. They pump more cargo in less time.
B. They are smaller for equivalent pumping ability.
C. They are less expensive.
D. They require priming for stripping.

31 1986 Ref: Tankers, Pump, Centrifugal
Which pump must always be primed?
A. Centrifugal pump
B. Reciprocating pump
C. Rotary pump
D. All of the above

32 2006 Ref: Tankers, Pump, Centrifugal
Which statement about a centrifugal cargo pump is TRUE?
A. It is a positive displacement pump.
B. It must have a positive suction.
C. Increasing rotation speed will decrease discharge pressure.
D. All of the above

33 2072 Ref: Tankers, Pump, Centrifugal
Which statement is TRUE of centrifugal pumps aboard tank vessels?
A. They are positive displacement pumps.
B. They are gravity-fed.
C. They produce a pulsating flow.
D. They require more maintenance than a reciprocating pump.

34 2479 Ref: Tankers, Pump, Centrifugal
You start a centrifugal cargo pump to discharge cargo. The pump works for a while and then loses suction. This could be caused by __________.
A. the pump running backwards
B. incomplete priming
C. the discharge head being too high
D. All of the above

35 2480 Ref: Tankers, Pump, Centrifugal
You start a centrifugal cargo pump to discharge cargo. The pump works for a while and then loses suction. This could NOT be caused by __________.
A. leaking shaft seals
B. air pockets in the liquid
C. high cargo level in the tanks
D. a leaking suction line

36 84 Ref: Tankers, Pump, Deep well
A deepwell pump is a type of __________.
A. screw pump
B. centrifugal pump
C. eductor
D. gear pump
37 2060 Ref: Tankers, Pump, Self-priming
Which statement is TRUE concerning deep well self-priming pumps?
A. When loading oil cargo, it is always loaded via the discharge line through to the pump until the tank is topped off.
B. Stripping systems are generally eliminated for the purposes of cargo handling.
C. In recent years deep well pumps have become increasingly unpopular in product tankers and medium size crude ships.
D. There is no danger of damaging the pump from overheating.

38 1072 Ref: Tankers, Pump, Stripping
The main function of a stripping system is to __________.
A. maintain the temperature of the cargo throughout the vessel
B. dispose of dangerous vapors within the cargo tanks
C. increase the loading rate of the shoreside pumps
D. discharge liquid left in the cargo tanks after the main pumps have discharged the bulk

39 1754 Ref: Tankers, Pump, Stripping
When stripping a tank, excessive air in the suction line may cause __________.
A. an over pressurized line
B. back pressure
C. loss of suction
D. increase of suction

40 2155 Ref: Tankers, Pump, Stripping
While discharging a cargo, the stripping of the tanks falls behind schedule. This would indicate the __________.
A. main pumps are working at a high discharge pressure
B. main pumps are leaving too much oil in the tanks
C. stripping pump is not primed
D. stripping line is cross-connected to the main line

41 2325 Ref: Tankers, Pump, Stripping
You are on a tankship discharging oil. When all of the oil that the main cargo pumps can handle is pumped out of a tank the remainder is __________.
A. stripped out and pumped directly ashore into the mainline as the remaining cargo tanks are pumped out with the main pumps
B. stripped to one tank and then pumped out with the main pumps
C. stripped out and pumped directly ashore after all the tanks have been emptied by the main pumps
D. gravitated to the centers from the wings and pumped out with the main pumps

42 1912 Ref: Tankers, Pump
Which method should be used to warm up the pump turbines prior to discharge?
A. Lock the turbine rotor and slowly bleed in steam until operating temperature is reached
B. Run the pump at high speed with the discharge valves closed
C. Run the turbine at slow speed with the pump disconnected
D. Shut the discharge valve and run the pump at slow speed

43 2463 Ref: Tankers, Pump
You may be able to avoid loss of suction in a pump by __________.
A. using a full tank to keep the pump primed
B. opening the vent cock on the pump
C. closing down on the tank valve
D. All of the above

44 204 Ref: Tankers, Spectacle Flange
A single fitting installed in a pipeline that either blanks off the pipe or allows a full flow passage of a liquid through the pipe is referred to as a __________.
A. blind flange
B. pivot coupling
C. quick-release coupling
D. spectacle flange
45  2156  Ref: Tankers, Stability, List  
While discharging a tanker, list can be controlled by _________.
A. shoreside personnel
B. using a center tank near the bow, discharging as necessary
C. using wing tanks near the longitudinal center, discharging as necessary
D. using the after peak tank, loading as necessary

46  302  Ref: Tankers, Stability, Trim  
A vessel loads edible oil in a deep tank through a manhole at the mid-length of the tank. In order to fill the tank to maximum capacity, what trim should the vessel have?
A. Down by the bow  
B. Down by the stern  
C. Down by either the bow or stern  
D. In level trim

47  2516  Ref: Tankers, Stability, Trim  
Your tank vessel is fully loaded, and you find that she is down slightly by the head. To adjust the trim, you may _________.
A. add ballast aft  
B. load more cargo aft  
C. shift cargo aft  
D. All of the above

48  2517  Ref: Tankers, Stability, Trim  
Your tank vessel is loaded down to her marks, and you find that she has too much trim by the stern. To adjust the trim you may _________.
A. add ballast forward  
B. load more cargo forward  
C. shift bunkers forward  
D. All of the above

49  660  Ref: Tankers, Static Electricity  
In order to reduce the accumulation of static electricity while loading petroleum products, you should _________.
A. start to load at maximum pressure  
B. start to load slowly  
C. increase the air flow into the tank  
D. use the overall method of loading only

50  852  Ref: Tankers, Static Electricity  
Static electricity may be built up by the _________.
A. spraying or splashing of petroleum  
B. settling of solids or water in petroleum  
C. flow of petroleum through pipes  
D. All of the above

51  1982  Ref: Tankers, Static Electricity  
Which product is most likely to accumulate static electricity?
A. Crude oil  
B. Hard asphalt  
C. Lubricating oil  
D. Residual fuel oil

52  2084  Ref: Tankers, Tank Cleaning, Gas Freeing  
Which step is NOT generally taken when gas-freeing a tank?
A. Washing the tank interior with sea water  
B. Application of degreasing solvents  
C. Removal of corrosion products and sludge  
D. Fresh air ventilation

53  1672  Ref: Tankers, Tank Cleaning, Portable  
When cleaning a tank by the Butterworth process, you should begin to pump out the slops _________.
A. at the end of the drop schedule  
B. when the process is started  
C. when the process is finished  
D. when the tank is clean
54 1673 Ref: Tankers, Tank Cleaning, Portable
When cleaning cargo tanks with portable machines, how is the machine grounded?
A. Bonding wires are secured from the machine to a convenient location on deck.
B. The machines must maintain physical contact with the deck at the Butterworth opening.
C. The water supply hoses contain internal wires that act as conductors.
D. The water jets impinging on the vessel's structure form a pathway to ground.

55 1759 Ref: Tankers, Tank Cleaning, Portable
When tank cleaning with a portable machine, the weight of the machine is suspended from _________.
A. solid iron bars clamped to the Butterworth opening
B. the supply hose
C. the suspension line, usually manila or natural fiber line
D. a wire rope suspension line

56 2460 Ref: Tankers, Tank Cleaning, Portable
You have water washed your cargo tanks using the fixed machines. What should you do before using portable machines to clean areas screened from the wash of the fixed machine by structural members?
A. Ventilate the tank to eliminate any electrostatically charged mist.
B. Attach the water supply hose to the portable machine after the cleaning head is positioned inside the tank.
C. Insure that the tanks are not stripped until the final wash is started.
D. Ground the fixed machines to eliminate any electrostatic buildup on the cleaning head.

57 2233 Ref: Tankers, Tank Cleaning, Static Electricity
You are cleaning the tanks after carrying a cargo of crude oil. Which statement is TRUE?
A. Washing water should be recirculated if possible because it has the same electric potential as the cargo tank being cleaned.
B. The hoses to portable cleaning machines should be disconnected before the machines are removed from the tank.
C. The principal hazard with steaming cargo tanks is raising the ambient temperature above the flame point of the cargo residue.
D. Steam cleaning and water washing are both capable of generating electrostatic charges within a tank.

58 1729 Ref: Tankers, Transfer, Bending Moments
When planning the loading or discharging of a VLCC (100,000 DWT+) what is the most important consideration?
A. Draft and trim
B. Limits of the bending moments
C. Rate of discharging
D. Rate of loading

59 812 Ref: Tankers, Transfer, Cargo Hose
Pinching of the cargo hose between the vessel and the dock should be prevented by _________.
A. adjusting the hose supports
B. laying out an excess length of hose on deck
C. tying off the topping lifts and runners to winch heads
D. All of the above

60 1319 Ref: Tankers, Transfer, Cargo Hose
To allow for the rise or fall in tide and for change in draft of a tankship during cargo transfer, cargo hoses must be suspended with _________.
A. slings or saddles placed at 25-foot (8 meter) intervals
B. enough slack in their bight
C. topping lifts and runners tied off to winches
D. All of the above
61  1692  Ref: Tankers, Transfer, Cargo Hose  B
When hooking up a cargo hose to your vessel's manifold, you should use a(n) _________.
A. international shore connection
B. insulating flange or single length of non-conducting hose
C. self-contained breathing apparatus
D. oxygen analyzer

62  2561  Ref: Tankers, Transfer, Cargo Hose  D
Your vessel is taking on cargo oil when a small leak develops in the hose. You order the pumping stopped. Before you resume pumping, you should _________.
A. notify the terminal superintendent
B. place a large drip pan under the leak and plug the scuppers
C. repair the hose with a patch
D. replace the hose

63  811  Ref: Tankers, Transfer, Coefficient of Expansion  A
Petroleum cargo tanks should not be topped off at deck level when loading on a cold day because _________.
A. a subsequent temperature rise will cause the cargo to overflow
B. air pockets may cause the cargo to bubble out of the ullage hole
C. the increased viscosity of the product requires higher loading pressure which increases the chances of a spill
D. the tank valve may be stiff and a spill will occur before the valve can be closed

64  2202  Ref: Tankers, Transfer, Coefficient of Expansion  A
With an increase in temperature the volume of flammable and combustible liquids _________.
A. expands  C. remains constant
B. contracts  D. remains constant if pressure remains constant

65  748  Ref: Tankers, Transfer, Containment  C
Oil may NOT be transferred unless _________.
A. there are two certificated tankermen on each vessel
B. the vessel is equipped with constant-tension winches
C. discharge containment equipment (i.e. drip pans) are in place
D. All of the above

66  1844  Ref: Tankers, Transfer, Contamination  A
Which factor must be considered when determining the order of loading of dissimilar products through the same piping system aboard a tanker?
A. Contamination of the cargo  C. Reid vapor pressures
B. Flash points  D. Specific gravities

67  698  Ref: Tankers, Transfer, Flanges  C
Insulating flanges minimize the dangers arising from _________.
A. smoking on deck  C. accumulations of electrostatic charges
B. loading asphalt  D. tank over-pressurization

68  2062  Ref: Tankers, Transfer, Flanges  A
Which statement is TRUE concerning insulating flanges?
A. They should be inspected and tested periodically to ensure that the insulation is clean and in good condition.
B. Switching off a cathodic protection system may be substituted for using an insulating flange
C. The measured resistance value after installation should be less than 1,000 ohms.
D. After the insulating flange is installed, hot work may be performed on deck.
Functions aboard a tanker or tank barge such as connecting, disconnecting, and topping off must be supervised by _________.
A. any certificated tankerman
B. the Master of the vessel
C. the officer of the watch
D. the person designated as "person in charge"

Cargo transfer operations on a tank vessel need NOT be stopped when _________.
A. a tug comes alongside while the tanker is loading grade D and E cargoes
B. a large, fresh oil spill is discovered immediately adjacent to the side of the tanker
C. there is an electrical storm in the vicinity
D. there is a fire on the dock or on a nearby vessel

When loading bulk liquid cargo, what is the FIRST action you should take if a cargo valve jammed open?
A. Trip the pump relief valve.
B. Order the dock man to shut down.
C. Call the owner, operator, or terminal supervisor.
D. Run out the vessel's or terminal's fire hose.

What is NOT a precaution to be taken when topping off?
A. Reduce the loading rate.
B. Notify the engine room of the procedure.
C. Maintain communications with the dock man.
D. Give the operation your undivided attention.

When discharging an oil cargo, the first consideration is to _________.
A. get the bow up
B. discharge from the centerline tanks first
C. discharge from the wings first
D. discharge from amidships first

Which tanker discharge pattern would be the safest and most efficient?
A. Empty the forward tanks and start working aft, emptying each tank in sequence
B. Start discharging with most of the discharge coming from forward, but include some from amidships and after tanks
C. Start pumping from forward, amidships, and aft with the discharge distributed equally among the tanks
D. Start pumping from amidships and then work forward and aft simultaneously as the amidships tank is emptied

What is an advantage of a gate valve over a butterfly valve?
A. Less frequent maintenance
B. Faster operation
C. Cheaper
D. More compact

Which characteristic is an advantage of a butterfly valve as compared to a gate valve?
A. Precise control over cargo flow
B. Quick operation
C. No resistance to cargo flow when open
D. Less maintenance required
The valve on the discharge side of a cargo pump on a tank vessel will usually be a _________.
A. gate valve  
B. butterfly valve  
C. globe valve  
D. check valve

To insure proper seating when closing a valve on a tank, the valve should be __________.
A. closed against the stop and the locking pin inserted  
B. closed, opened a half turn, and then closed again  
C. set up as tight as possible by hand  
D. set up tight using a valve wrench

When loading a tanker, you should __________.
A. load only one tank at a time  
B. keep the seamen on watch on standby in the mess room  
C. keep a strain on the loading hoses  
D. close valves by closing them down, reopening one or two turns, and re-closing

What is the purpose of pressure-vacuum relief valves?
A. Regulation of discharge pressure from cargo pumps  
B. Maintaining constant velocity in cargo lines  
C. Regulation of suction head on cargo pumps  
D. Automatic regulation of pressure or vacuum in enclosed spaces

What is TRUE of pressure/vacuum valves?
A. They are designed to provide for the flow of small volumes of tank atmospheres caused by thermal variations in a cargo tank.  
B. They should operate in advance of the pressure/vacuum breakers.  
C. They should be kept in good working order by regular inspection and cleaning.  
D. All of the above

A relief valve for a cargo pump is generally installed __________.
A. after the discharge valve  
B. between the pump and discharge valve  
C. after the suction valve  
D. between the pump and suction valve

Cargo pump relief valves are piped to the __________.
A. cargo pump pressure gauges  
B. crossover lines interconnecting two pumps  
C. suction side of pumps  
D. atmosphere through pump vents

What is the purpose of the relief valve of a cargo pump?
A. Provides for the removal of vapors  
B. Allows two or more tanks to be filled at the same time  
C. Provides for the emergency shutdown of the pump  
D. Permits the return of cargo to the suction side of the pump