

Overview of Petroleum Industry

Test #2

Chapters 7-10

Name _____

PTRT 1301 chp7, 8 and 9 Test #3 -

~~November 6, 2015~~

April, 2016

PTRT 1301 chp7 TEST

Mark best answer (darken one selection on scantron using PART ONE for ch7 and 8)

Do not write on test papers. Provide last name, first name, class meeting days, class meeting time, date, test #, chapters covered on the SCANTRON.

- 1- For production operation of a well, the top of the wellbore is usually outfitted with a collection of valves and other components called a Christmas tree. A-true b-false
- 2- If well reservoir pressure increases, artificial lift methods can be employed to maintain economic production. A-true b-false
- 3- Following initial production, two things happen: ----- (which is heavier than oil and much heavier than gas) begins to encroach into the formation; and reservoir pressure ----- as the reservoir depletes. If no action is taken, then flow from the well will eventually stop. A-gas, increases b-oil, decreases c-water, increases d-water, drops (decreases)
- 4- The motor-driven sucker-rod pump (also called a pump jack) is by far the most common type of artificial lift. A-true b-false
- 5- In gas lift, compressed gas (often, natural gas) is injected into the annulus between the casing and the tubing. A-true b-false
- 6- Prior to workover, a well must be shut in to stop production. Flow is killed by pumping brine, drilling mud, oil, or some other fluid down into the annulus, between the casing and the tubing, and back up the tubing string. A BOP is usually installed as well, and the tubing string and other downhole equipment are removed. A-true b-false
- 7- Workover can include the following steps: a- Removal of water or drilling mud (swabbing), done either right after a well is completed or later (to restore production in an operational well) or repair of damaged tubing or casing or of the cement around the casing
b- Repair or replacement of downhole pumps, valves, and packers or Installation of smaller-diameter tubing to boost flow rates or removal of scale (salts, e.g., calcium sulfate) or paraffin from tubing or Cleanout of loose sand from the bottom of wells drilled in sandstones c-all of the above d-none of the above
- 8- A sidetrack well is drilled using special drill tools—such as a whipstock, bent housing, or bent sub—are used to drill outward at an angle from the original well. The new wellbore is completed in the conventional manner, and drilling continues after a liner is set. A-true b-false
- 9- If operators conclude that a particular pay zone is depleted, a technique called recompletion may be undertaken. This is the completion of other pay zones below or above the original zone. Cement is used to seal off the original producing zone. A-true b-false
- 10- In a deep water workover, the use of a remotely operated vehicle (ROV) is often a better option than using divers. A-true b-false

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- 11- Oil produced by the original pressure in a formation is called _____ production. For most wells, _____ production yields only about 30%-35% of the oil in place. (For gas wells, _____ production generally yields about 80% of the gas in place, so less attention is given to improved recovery.) a-first, master, master b-master, first, first c-master, master, master d-primary, primary, primary
- 12- A common technique often used first by operators to extract additional oil is called water flood, which can recover _____ of the remaining oil. A- 60%-70% b-5%-50% c-70%-75% d-75%-85%
- 13- Another set of methods to extract additional oil are collectively known as enhanced oil recovery. These methods involve the introduction of substances not naturally found in a reservoir and include the use of gases, chemicals, or thermal energy. A-true b-false
- 14- In gas injection, the operator sends carbon dioxide, nitrogen, or liquefied petroleum gas (LPG) into the reservoir gases that are miscible (dissolve in the oil). The gas then pushes the fluid oil through the pores and cracks in the rock toward producing wells. This approach can often recover _____ of remaining oil. A-90% b-80% c-35% d-70%
- 15- What injection method injects things into a depleted sandstone reservoir in separate batches, or slugs? A-gas injection b-hydraulic injection c-steam injection d-chemical flood (injection)
- 16- What injection method is called "puff and Huff"? A-cyclic gas injection b-cyclic hydraulic injection c-cyclic steam injection d-cyclic chemical injection
- 17- Steam flood or steam-drive technique is a thermal recovery method that pumps superheated steam into injection well to heat up oil to increase its viscosity (resistance to flow). A-true b-false
- 18- Steam-assisted gravity drainage (SAGD) has been used with great success in the tar-sands formations of Alberta. Steam is injected into an upper horizontal well to melt the tarlike bitumen, which flows downward into a lower horizontal well. The bitumen is then pumped from that lower well to the surface. By some estimates, SAGD can recover up to 60% of the oil in place. A-true b-false
- 19- _____, is used in relatively shallow reservoirs, operators use a gas burner or other ignition source to set on fire the subsurface oil in one part of the formation. A-heated chlorine injection b-heated hydraulic injection c-heated fluid injection d-in situ combustion
- 20- Natural gas from a well that was drilled chiefly to extract oil is called associated gas—that is, the gas is associated with oil production. A-true b-false
- 21- If a well is drilled specifically for natural gas and yields little or no oil, then the gas produced is called associated gas. A-true b-false
- 22- About 75% of the raw natural gas in the United States comes from underground reservoirs that hold little or no oil. A-true b-false
- 23- A device called a wellhead separator performs initial cleanup, removing water, condensate and sediment. Dirt and sand are removed with filters or traps. Water vapor is typically removed by passing the gas through a desiccant material, such as silica gel or alumina (solid granules) or glycol (a liquid). A-true b-false

- 24- A network of small-diameter, low-pressure piping called a gathering system routes the gas from multiple (sometimes more than 100) wells to the gas plant. A-true b-false
- 25- When only hydrogen sulfide is present, natural gas is referred to as sour. Natural gas is described as sweet after the removal of hydrogen sulfide. A-true b-false

PTRT 1301 ch8 TEST revised 06/21/2015

~~Mark best answer (darken one selection on scantron)~~

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- 26 - A separator at a well site is used to remove both the natural gas and the water. A-true b-false
- 27 - Technicians usually convert measured oil depth in tanks to oil volume. A-true b-false
- 28 - Because volume of oil changes with temperature, industry standards call for correcting the volume for a temperature of -----°F. a-40 b-50 c-60 d-70
- 29 - The Sumed (Suez-Mediterranean) Pipeline moves 2.5 million b/d of Saudi and other Mideast oil to Europe across Egypt. A-true b-false
- 30 - Points at which pipelines come together are called hubs (or marine terminals if near a port). Significant storage volume is generally available at such facilities. A-true b-false
- 31 - Other primary U.S. hubs and marine terminals for crude oil are at New York Harbor; the Gulf Coast (Texas-Louisiana coast); Tulsa, Oklahoma; Chicago; and Los Angeles. A-true b-false
- 32 - Most pipelines are buried three to six feet below the ground. A-true b-false
- 33 - Steel pipe is fabricated with various wall thicknesses and with outside diameters ranging from 4.5 to 48 inches. A-true b-false
- 34 - _____, _____, _____, and _____ governmental and industry organizations track and report releases from U.S. pipelines. a-US Department of Trade, Commerce, Labor, Pipeline and IEEE b-US Department of Human Services, Urban Development, Pipeline, Labor, and Society of Petroleum Engineers c-US Department of Pipelines, Pipe Fitters Union, API, SPE, and Society of Geological Surveyors
- 35 - d- US Dept of Transportation Pipeline and Hazardous Materials Safety Administration [PHMSA]), the Association of Oil Pipe Lines, the American Society of Mechanical Engineers, API, and the Interstate Natural Gas Association of America
- 35 - In _____ technicians measure the difference in voltage between the pipe and the adjacent soil or the magnitude of current flow between two points on the pipeline. A-pipeline survey b-pipeline joint survey c-computer pipe survey d-electrical current/voltage survey
- 36 - Shell's Perdido platform began producing oil and gas in March 2010 from a network of 35 wells at a water depth of about 8,000 feet. a-true b-false
- 37 - A _____ is a steel or flexible composite pipe typically 6–12 inches in diameter—carries hydrocarbons to a manifold (see below) if the distance is about 100 feet or less. For longer distances (up to tens of miles), the connecting pipe is called a _____. A-joint, joint line b-junction, junction line c-bushing, bushing line d-jumper, flowline

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- 38 - A manifold is where jumps from several well heads can be connected. Fluid leaves in a single flowline A-true b-false
- 39 - Hydrate is a crystalline material, similar in appearance to a snowball, in which methane molecules are trapped in a lattice of water molecules. A-true b-false
- 40 - Flexible riser pipes for off-shore are fabricated by wrapping an inner ----- core with alternating layers of steel wires and thermoplastics. A-plastic b-nylon c-steel d-hard fabric
- 41 - One common method in pipeline assembly is to weld together and coat pipe sections—typically 40–240 feet long and 16–42 inches in diameter, with walls at least 1 inch thick—at a shore-based facility. A-true b-false
- 42 - In reel pipeline laying, suitable only for laying pipe 6–18 inches in diameter, operators weld together and coat the pipe sections on land and then wind the finished product onto very large reels. (More than 30,000 feet of 6-inch pipe can fit on one such reel.) a-true b-false
- 43 - Crude oil is transported around the world on seagoing tanker ships—a mode of delivery that is second only to a pipeline in cost-effectiveness. A-true b-false
- 44 - A vessel's cargo-carrying capacity is about -----% of its deadweight metric tonnage (DWT). One DWT of capacity is equivalent to about 7.5 barrels of oil. A-55 b-65 c-75 d-95
- 45 - The term supertanker is used for very large crude carriers (VLCCs) and ultralarge crude carriers (ULCCs), which can carry a cargo of more than ----- million barrels. A-92 b-82 c-90 d-2
- 46 - EIA reported that crude shipments from domestic producers to U.S. refineries by tanker truck totaled approximately 145 million barrels in 2010. For railcars, the corresponding figure was roughly 9 million barrels. A-true b-false
- 47 - Salt caverns are also used to store crude oil (as well as natural gas and propane). The caverns are created within underground salt domes or beds by pumping water into the formation to dissolve the salt. The brine is then pumped out to leave a hollow cavern. A-true b-false
- 48 - According to EIA, approximately 4.1 billion barrels of oil are held in strategic reserves around the world (including in the United States). A-true b-false

PTRT 1301 ch9 TEST

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- 49 - The raw gas typically will contain some water vapor, as well as minor amounts of natural gas liquids (NGLs)-----, -----, -----, and ----- . Some nonhydrocarbon gases also may be present, including carbon dioxide, helium, hydrogen sulfide, and nitrogen. A-oxygen, acetylene, carbon, and carbon monoxide b-oxygen, neutron, penton, and benzene c-ethane, propane, butanes and pentane d-hydrogen dioxide, acetylene, base, and carbonated liquids
- 50 - The gas flows to local distribution companies (LDCs, also called-----) that take control of the gas at critical facilities called-----stations. A-gas member, gas company b-company reps, gas company c-gas bellows, large pipeline D- gas utilities, city gate

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- 51 - On the last leg of the journey, the gas flows through lines of still smaller diameter, called -----
-----, Meters measure the amount of gas used by individual customers. A-little pipes (or
meter packs) b- service lines (or services) c-regulators (or regulated packs) d-
demarcation pipes (or customer pipes)
- 52 - Oxyacetylene and electric arc welding helped development natural gas pipelines in 1920s (long
sections of seamless steel pipe were used in long-distance transport of natural gas lines). A-
true b-false
- 53 - In mid-October 2011, Kinder Morgan, based in Houston, announced a definitive agreement to
buy El Paso for \$20.7 billion. The acquisition will create the largest natural gas pipeline network
in the United States, extending some 67,000 miles. A-true b-false
- 54 - A transmission pipeline system is often referred to as a mainline or a trunk line if it covers a long
distance, uses chiefly large-diameter pipe, and runs directly from a major gas supply source to a
market area or an LDC, with few laterals or branches. A-true b-false
- 55 - September 9, 2010 gas explosion in San Bruno, California (near San Francisco), that killed eight
people and destroyed 37 homes, had strong effect making the new federal pipeline safety act.
A-true b-false
- 56 - Because of the friction that occurs when a fluid flows within a pipeline, gas pressure drops with
distance and must be boosted. This is achieved by building additional -----stations every ----
-----miles. A-gas station, 10-20 b-liquefier, 10-20 c-filtering, 10-20 d-compressor, 50-
100
- 57 - Gas producers need accurate records of how much gas they put into a pipeline, how much is
delivered to intermediate parties at various transfer points along the pipeline route, and how
much is removed at the delivery end. This is needed because a-need for accurate payment
amount by customer b-to determine if there is a leak or loss of gas c-need to know amount
of gas used by the pipeline operators d-all of the above a, b, and c
- 58 - Pipeline companies use a system called -----to balance short term swings in demand. This
entails an operator's moving gas into storage at night and extracting it early in the day, on a
daily basis, year-round. A-white storage b-business storage c-tanking storage d-
operating storage
- 59 - Total gas storage capacity is the volume of gas in the reservoir above the level of base gas (in
other words, the amount available to the marketplace). A-true b-false
- 60 - There are two basic types of LDCs: private firms owned by investors, and public gas systems
owned by local municipalities. According to EIA, LDCs deliver 99% of the gas used in the
residential sector and 98% of the gas used in the commercial sector. A-true b-false
- 61 - Gas typically flows into a city gate station at a pressure of 1,000–1,500 psi. a-true b-false
- 62 - Supply mains carry gas at ----- psi from city gate stations to regulator stations that reduce the
pressure and move the gas into feeder mains. a-1/4-2 PSI b-5-10 PSI c-50-60 PSI d-100-200
PSI
- 63 - Pipes used most commonly in a gas distribution system are made of steel, cast iron, ductile iron,
plastic, or copper. A-true b-false

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- 64 - Sections of plastic pipe (and fittings used with them) are typically joined with adhesives or by a process called -----melting the plastic and applying pressure to fuse the pieces together. A-PVC fusion b-donut fusion c-bushing fusion d-heat fusion
- 65 - Survey crews also watch for another indicator of leakage—namely, the change in color of vegetation, from green to brown or yellow, due to the drying effect of escaping gas. A-true b-false
- 66 - Corrosion on the outside wall of a pipeline is called external or atmospheric corrosion and is accelerated in areas of humidity, pollution, and hot or fluctuating temperatures. A-true b-false
- 67 - Corrosion of buried pipe—the leading cause of leaks from buried gas mains—occurs when a small -----flows from the pipe into the ground, causing deterioration of the pipe material.
A-amount of liquid b-amount of physical materials c-amount of solids d-amount of electricity

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- 11- Total gas storage capacity is the volume of gas in the reservoir above the level of base gas (in other words, the amount available to the marketplace). A-true b-false
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- 1- Transforming natural gas into a cryogenic (ultracold) liquid increases its energy density dramatically, permitting movement by ship, barge, or tank truck instead of by pipeline. Shipment of industrial gases such as _____, _____, and _____ could use the same technique. A-acetylene, argon, carbon b-nitrogen, oxygen, hydrogen
- 2- When natural gas (at atmospheric pressure and 60°F) is cooled below its boiling point (-263°F), its volume can be reduced by a factor of more than 600, and it can be stored and shipped without pressurization in liquid form. A-true b-false
- 3- Liquefaction can be particularly valuable in bringing to market stranded gas—that is, gas that is not located close to users and that would require significant investment in infrastructure to transport it to market. A-true b-false

- 4- LNG will remain an ultracold liquid with no need for a cooling system because of the naturally occurring process called———. A-cook-off b-freeze-off c-steam-off d- boil-off
- 5- The first use of LNG for peak-shaving by a local gas distribution company occurred in the late 1930s in the United States. A-true b-false
- 6- By 2010, some 24 liquefaction facilities and 80 import (regasification) facilities were in operation around the world, served by a tanker fleet of about 330 vessels. A-true b-false
- 7- As of mid-2011, there were 11 U.S. facilities (as well as another in Peñuelas, Puerto Rico) capable of importing and regasifying LNG. ————, Texas and ————Luisiana are two examples of LNG plants. A-Galveston, Houma b-Texas City, Morgan City c-Orange, Shreveport d-Freeport, Lake Charles
- 8- Natural gas from various formations and regions will differ in composition. It is primarily methane, with small amounts of ethane, propane, butane, and pentane. It may also contain condensates (light oils) and other constituents. A-true b-false
- 9- Ethane, propane, butane, or pentane will———-the heating value of methane, while nitrogen and carbon dioxide will ———— it. A-reduce, raise b-false, reduce
- 10- The process of removing carbon dioxide or hydrogen sulfide is called———. Removal of water or water vapor is called———. A- sweetening, hydration b- hydration, dehydration c-sweetening, dehydration d- dehydration, sweetening
- 11- The system of equipment used to liquefy LNG is called a train. A-true b-false
- 12- A range of proprietary systems have been developed for liquefaction, but the following are the primary equipment in a train a-Hydrocracking, Packers, and Plastic Discs b- Compressors, Heat exchangers, and Flash valve
- 13- All LNG storage tanks have double walls, and tank pressure is maintained at just above atmospheric pressure (——— psi). a-150-200 PSI b-15-20 PSI
- 14- The term single containment means that the outer tank is not designed to contain any LNG that escapes from the inner tank; instead, the escaped LNG would flow into a secondary containment system, typically an area around the tank that is ringed by dikes. A-true b-false
- 15- Double Containment is similar to single except that the outer tank (made of reinforced concrete and strengthened by a wall of earth or rock) can contain any LNG that leaks from the inner tank. A-true b-false
- 16- A Full Containment LNG tank is like the single containment tank with an added concrete roof. A-true b-false
- 17- A Membrane Storage LNG tank is a flexible stainless steel membrane supported by layer of insulation that is mounted on an outer prestressed concrete wall. A-true b-false
- 18- A cryogenic piping system carries the LNG from the tanks to the jetty. It can take 24 hours to moor a tanker, connect the loading system, and slowly cool the LNG cargo tanks prior to loading. A typical jetty can handle about 215 loadings per year (about 13 million tons of LNG) servicing larger tankers. A-true b-false
- 19- Gravity-based Structure is an offshore Liquefaction concept that is intended for use in —— water. A-deep b-shallow

- 20- Floating LNG vessels are being designed by Royal Dutch Shell Company that is as long as four football fields for use in———. A-Norway's East Coast b-Australia's northwest coast
- 21- The cargo tanks (containment system) on an LNG tanker must provide a gas-tight seal to prevent mixing of gas vapor with air; insulate the LNG from heat, to minimize boil-off; and prevent the steel hull of the ship from becoming very cold, which could make it brittle. A-true b-false
- 22- In LNG Tanker Ship (Moss design), the LNG is stored in several large ——tanks, the top half of which protrude above the deck. A-concrete b- aluminum
- 23- In LNG Tanker Ship (membrane design), the tank walls are built into the ship after the hull has been constructed and are located ——decks. A-above b-below
- 24- Regardless of the containment system, care must be taken to avoid imposing a thermal shock on the LNG tank when a cargo is loaded. In traditional practice, a small volume of LNG (called LNG heel) is left in the tank throughout a vessel's trading period. This concept minimizes a-time to cool the tanks b-cost of cooling the tanks c-stress on the containment system d- all of the above a, b, and c
- 25- A tanker carrying 4.7 million cubic feet of LNG will discharge about 60,000 tons of liquid that becomes about 3 bcf of gas when regasified. A-true b-false
- 26- The largest vessels are about ——feet long and ——feet wide and can travel at about —— knots. A typical LNG tanker crew would number about —— members. A-2000, 200, 200, 135 b-2000, 400, 400, 135 c-2000, 300, 300, 35 d-1200, 180, 20, 35
- 27- Once an LNG tanker completes its voyage, it typically moors at a———, often built on the coast or on the shore of a river with easy access to the ocean. A-large floating LNG tank system b- large marine LNG receiving terminal
- 28- Regasification This process routes the LNG through vaporizers (heat exchangers) in which it is brought into indirect contact with seawater, air, the exhaust from a fuel-burning heater, or heated water. A-true b-false
- 29- Offshore regasification systems will need to prove their safety, reliability, and economic feasibility in the coming years before being widely adopted. A-true b-false
- 30- National Fire Protection Association has developed standard NFPA 59A, which pertains to LNG production, storage, and handling. NFPA 59A incorporates a range of industry standards developed by such professional organizations as A-American Society of Civil Engineers, the American Society of Mechanical Engineers b-American Concrete Institute, API c-American Society for Testing and Materials d-all of the above a, b, and c