Multiple Choice – Clearly circle the correct answer. There is ONLY one answer to each statement.

1. An important characteristic of a completion and workover fluid is:
   1. Dense enough to fracture the producing formation.
   2. Dense enough to control well pressure but not so dense that it fractures the producing formation
   3. Potable
   4. Corrosive
2. A fluid spacer performs this function:
   1. Keeps an incompatible completion or workover fluid from contacting the cement or acid to prevent contamination.
   2. Prevents the fluid from contacting the sides of the casing or tubing.
   3. Keeps the segments of tubing from impacting one another.
   4. None of the above
3. A disadvantage of an oil-based completion fluid is:
   1. It could contain wax, sand, asphalt or other solids that can damage a formation.
   2. It may be corrosive if it contains H2S or CO2.
   3. Oil may be too low in density to maintain control of formation pressures
   4. All of the above.
4. The practical limit to the maximum density of NaCl brines occurs because:
   1. The amount of NaCl to be added for densities higher than the maximum is less than the solubility limit.
   2. The amount of NaCl to be added for densities higher than the maximum is greater than the solubility limit.
   3. NaCl is too low a density to be used as a weighting additive in brines.
   4. There is no limit to the density you can achieve with a NaCl brine.
5. The main reason that temperature correction must be applied to brines is:
   1. The thermometer will not record the correct temperature without the correction.
   2. The temperature of the brine increases as it goes downhole which increases the density of the brine.
   3. The temperature of the brine increases as it goes downhole which decreases the density of the brine.
   4. None of the above.
6. The blowout stack is typically assembled using the following API guideline:
   1. RP-67
   2. RP-53
   3. BOP-32
   4. We don’t need no stinkin guidelines
7. The preventer at the top of the stack that can close around a variety of equipment, including the kelly, drill collars, drill pipe, etc, plus even close on itself in an emergency is called the:
   1. The blowout preventer
   2. The big squeeze
   3. The annular preventer
   4. The ram preventer
8. Stripping pipe through an annular preventer can be done but to reduce the likelihood of damage to the preventer the following should be done:
   1. Operate the preventer at the maximum closing pressure of 1,500 psi
   2. Ignore the directions of the engineering staff
   3. Operate the preventer at a reduced closing pressure (typically around 800 psi)
   4. You cannot strip pipe with an annular preventer.
9. Ram preventers are versatile devices that are specifically designed to close around various items. The one item that they are NOT designed to close around is:
   1. An open hole
   2. A section of drill pipe
   3. A tool joint
   4. They can close on anything in the well.
10. These items are essential to proper operation of either ram or annular preventers:
    1. Regular inspection and maintenance.
    2. Routinely closing onto an open hole.
    3. Frequent meetings to discuss the operation of the preventer.
    4. All of the above

Fill in the Blanks:

1. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a stable fluid added to the annular space between the tubing and the casing.
2. An increase in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will cause the density of brine to decrease.
3. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a steel cylinder used to store hydraulic fluid under pressure containing a nitrogen-gas filled bag or bladder that maintains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as hydraulic fluid is removed during operation.
4. The nitrogen gas bag must be used because hydraulic fluid cannot be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but nitrogen gas can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. The lower limit of operating pressure in the BOP operating unit is \_\_\_\_\_\_\_\_\_\_\_\_ psi, that is it takes at least this must pressure to close the preventer.
6. By using an 80 gallon cylinder, a nitrogen precharge of 1000 psi and a maximum fill pressure of 3000 psi the amount of useable fluid in each cylinder of the BOP operating unit will be \_\_\_\_\_\_\_\_\_\_\_\_ gallons.
7. The nitrogen precharge must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ periodically to make sure it is at the proper pressure.
8. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ provides a flow path for circulating fluids out of the BOP stack under controlled conditions. It contains several lines so that flow can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the event that repairs need to be made on a valve or other component.
9. Chokes may be \_\_\_\_\_\_\_\_\_\_\_\_\_\_ or adjustable. Adjustable chokes may be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are used to close off the workstring to prevent uncontrolled flow through the tubing. These must be stabbed onto the workstring while \_\_\_\_\_\_\_\_\_\_\_ and then closed to shut off the flow of fluids.

List three functions of a completion and workover fluid and explain the key aspects of that function.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Extra credit: Using Table 5.2 Determine the following:

An accumulator cylinder has a size of 80 gallons.

The total capacity of the cylinder is \_\_\_\_\_\_\_\_\_\_\_\_ gallons.

If the precharge is 1000 psi and the maximum pressure when filled is 3000 psi then the amount of hydraulic fluid contained in the bottle when full is \_\_\_\_\_\_\_\_\_ gallons.

However, only \_\_\_\_\_\_\_\_\_\_\_\_\_ gallons of this fluid is useable.

If the precharge stays the same but the maximum pressure when filled is reduced to 2000 psi then the amount of useable hydraulic fluid contained in the bottle when full is now \_\_\_\_\_\_\_\_\_\_\_ (what fraction) of the previous case.