Cable-Tool Drilling

The cable-tool method was the earliest use; now it is employed only where the oil sands are not very deep or when there isn't much hard-rock drilling. It is cheaper than rotary drilling, because the hole doesn't need to be lined all the way down with expensive steel pipe as is the case with the rotary-drill hole.

In cable-tool drilling, a bit on the end of a heavy drill stem suspended from a wire cable is raised and allowed to fall so that bit pounds and crushes the rock at the bottom of the well. Each time it falls it grinds its way down deeper. The up-and-down motion of the drill stem is achieved by hooking the wire cable from which it hangs to a walking beam. A crank on a wheel rocks the beam up and down. From time to time the tools are raised from the hole by a cable wound around a bull wheel, for sharpening. While the tools are out, the well is flushed out, and a bailer is dropped down to remove the drilling chips and sludge.

If the well passes through beds of soft sand or mud likely to cave in, sections of steel pipe or casing, are lowered into it as a lining to keep the hole from flooding or caving.

Mark the statement as true (+) or false (-)s:

1. The cable-tool method is the most commonly used drilling method today.
2. The cable-tool method is cheaper than rotary drilling because it doesn't require expensive steel pipe.
3. In cable-tool drilling, the drill stem is suspended from a rope.
4. The drill bit in cable-tool drilling pounds and crushes the rock at the bottom of the well.
5. The up-and-down motion of the drill stem in cable-tool drilling is achieved by a motor.
6. The tools in cable-tool drilling are raised from the hole for sharpening.
7. The well is flushed out while the tools are in the hole.
8. Steel pipe is used as a lining in cable-tool drilling to prevent flooding or caving.
9. Cable-tool drilling is used only when the oil sands are very deep.
10. Cable-tool drilling is used only when there is a lot of hard-rock drilling.

Choose the correct answer to the questions:

1. What is the cable-tool method used for?

a) Drilling in oil sands that are not very deep
b) Drilling in hard-rock areas
c) Both a and b
d) None of the above

2. Why is cable-tool drilling cheaper than rotary drilling?
a) The hole doesn't need to be lined with expensive steel pipe all the way down
b) It requires less manpower
c) It is faster than rotary drilling
d) Both b and c

3. How is the up-and-down motion of the drill stem achieved in cable-tool drilling?
a) By hooking the wire cable from which it hangs to a walking beam
b) By using a crank on a wheel
c) By using a hydraulic system
d) Both b and c

4. What is done while the tools are out of the hole during cable-tool drilling?
a) The well is flushed out
b) A bailer is dropped down to remove the drilling chips and sludge
c) Both a and b
d) None of the above

5. What is used to raise the tools from the hole during cable-tool drilling?
a) A walking beam
b) A wire cable
c) A bull wheel
d) A hydraulic system

6. What is done to prevent the hole from flooding or caving in during cable-tool drilling?
a) The well is flushed out
b) A bailer is dropped down to remove the drilling chips and sludge
c) Sections of steel pipe or casing are lowered into it as a lining
d) None of the above

7. What is the purpose of the bit in cable-tool drilling?
a) To crush the rock at the bottom of the well
b) To remove the drilling chips and sludge
c) To line the hole with steel pipe
d) None of the above

8. When is the cable-tool method employed?
a) When there isn't much hard-rock drilling
b) When the oil sands are not very deep
c) Both a and b
d) None of the above

9. What is the tool used to remove the drilling chips and sludge during cable-tool drilling?
a) A walking beam
b) A wire cable
c) A bailer
d) A hydraulic system

10. What is the main difference between cable-tool drilling and rotary drilling?
a) The cost
b) The type of bit used
c) The motion of the drill stem
d) The depth of the well