

***** EXAMINATION *****

HYSTERETIC RELATIVE PERMEABILITY EFFECTS AND RESERVOIR CONFORMANCE

1. **The differences between hysteretic effects in saturation may be**
 - a) initial and trapped
 - b) mobile
 - c) irreducible
 - d) Any of the above

2. **Hysteretic effects can impact reservoir production**
 - a) in a favorable way only
 - b) in an unfavorable way only
 - c) either a or b
 - d) None of the above

3. **Adverse hysteretic effects include**
 - a) phase trapping
 - b) mobility control in cyclic projects
 - c) loss of disposal pond fluids
 - d) All of the above

4. **Relative permeability values strongly control**
 - a) the flow mechanics of every reservoir
 - b) the pressure response of every reservoir
 - c) the production response of every reservoir
 - d) All of the above

5. **For water-oil systems, relative permeability is expressed as**
 - a) functions of water
 - b) functions of total liquid saturation
 - c) functions of injected acid gas
 - d) functions of any hydrocarbon

6. **For gas-liquid systems, relative permeability is expressed as**
 - a) functions of water
 - b) functions of total liquid saturation
 - c) functions of injected acid gas
 - d) functions of any hydrocarbon

7. **Relative permeability are function of parameters such as**
- a) pore system geometry
 - b) wettability and tortousity
 - c) temperature and viscosity of fluids
 - d) All of the above
8. **The relative permeability for a given phase is**
- a) greater when its saturation is being decreased
 - b) greater when its saturation is being increased
 - c) greater when its saturation is held constant
 - d) not related to saturation
9. **Trap hysteresis is the difference between**
- a) hydrocarbon and acid gas content
 - b) hydrocarbon and water content
 - c) acid gas and drilling fluid content
 - d) None of the above
10. **Microscale hysteretic effects are sometimes known as**
- a) wet hysteresis
 - b) dry hysteresis
 - c) drag hysteresis
 - d) projected hysteresis
11. **Contact angle hysteresis is illustrated in**
- a) Figure 1
 - b) Figure 2
 - c) Figure 3
 - d) Figure 4
12. **Initial fluid saturation is the true fraction of the rock actually**
- a) occupied by oil, gas, and water at initial reservoir conditions
 - b) occupied by oil, gas, and acid at initial reservoir conditions
 - c) occupied by oil, gas, and solids at initial reservoir conditions
 - d) occupied by oil, gas, and liquid at initial reservoir conditions
13. **Water alternating gas treatment is used to reduce the**
- a) expansion of injected gas in a horizontal gas injection project
 - b) mobility of injected gas in a horizontal gas injection project
 - c) expansion of injected gas in a vertical gas injection project
 - d) mobility of injected gas in a vertical gas injection project
14. **Anti-water coning technology is used in**
- a) light oil reservoirs
 - b) sweet oil reservoirs
 - c) heavy oil reservoirs
 - d) Any of the above

15. **Gas phase relative permeability may be affected by selective**
- a) treatment with an immiscible fluid
 - b) treatment with water
 - c) treatment with acid gas
 - d) None of the above
16. **The establishment of a trapped gas saturation in the oil saturated strata**
- a) is desirable
 - b) is undesirable
 - c) may increase permeability
 - d) None of the above
17. **Oil injection may free**
- a) bottom water
 - b) acid gas
 - c) dispersed water
 - d) None of the above
18. **Oil injection may reduce the effective permeability to water**
- a) as much as 35%
 - b) as much as 55%
 - c) as much as 75%
 - d) as much as 95%
19. **The best type of fluid for oil injection would be**
- a) heavy oil
 - b) grease
 - c) a low viscosity hydrocarbon
 - d) a high viscosity hydrocarbon
20. **The successive displacement process**
- a) causes residual oil saturation to be substantially reduced
 - b) takes place best in some heterogeneous carbonate formations
 - c) is the result of hysteretic effects
 - d) All of the above

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