

**\*\*\* 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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