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***** EXAMINATION *****

APPLICATION OF HEAT TREATMENT TO ENHANCE PERMEABILITY IN TIGHT GAS RESERVOIRS

1. **In tight reservoirs, phase trapping has the same effect as**

   a) water-blocking
   b) horizontal drilling
   c) water flooding
   d) None of the above

2. **The formation heat treatment process is used to**

   a) vaporize block water
   b) dehydrate clay-bound water
   c) destroy clay lattices
   d) All of the above

3. **Formation damage can occur during**

   a) the initial drilling
   b) the completion of the wellbore
   c) the depletion of the reservoir during production
   d) Any of the above

4. **Preventive measures for tight gas reservoir formation damage**

   a) have at least a 20% chance for success
   b) have at least a 50% chance for success
   c) have at least a 80% chance for success
   d) are not always possible or effective

5. **A non-thermal curative process is to bypass near**

   a) wellbore damage using horizontal drilling
   b) wellbore damage using hydraulic fracturing
   c) wellbore damage using destructive fracturing
   d) wellbore damage using non-destructive fracturing

6. **A non-thermal curative process is to stimulate**

   a) the near wellbore region using alkalis
   b) the near wellbore region using nitrates
   c) the near wellbore region using acids
   d) the near wellbore region using phosphates

7. **The formation heat treatment of clay depends**

a) on the heating temperature
b) on the amount of pressure applied
c) on the length of the drill bit
d) None of the above

8. **The core samples to measure effective permeability are**

a) mounted in a tri-axial core holder
b) mounted in a bi-axial core holder
c) mounted in a specialized kaolin core holder
d) None of the above

9. **The core samples to measure effective permeability are**

a) confined in the core holder at excess overburden pressure
b) confined in the core holder at nominal overburden pressure
c) confined in the core holder at minimum overburden pressure
d) None of the above

10. **Measurement of the nitrogen flows through the core includes**

a) pressure
b) temperature
c) velocity
d) All of the above

11. **The nitrogen is measured using**

a) an accelerometer
b) an pisometer
c) a nitrogen permeater
d) Any of the above

12. **Permeabilities are measure at three rate for**

a) distribution corrections
b) Klinkenberg corrections
c) reverse flow corrections
d) forward flow corrections

13. **Heat cycling was conducted by placing the respective core**

a) samples in an Inconel reactor
b) samples in a Klinkenberg reactor
c) samples in a Stevens reactor
d) samples in a Bamburg reactor

14. **The formation heat treatment process would**

a) not be effective in sandstone formations with moderate permeability
b) be effective in sandstone formations with moderate permeability
c) be effective in sandstone formations with low permeability
d) be effective in sandstone formations with high permeability

15. **Microfractures resulting from high water temperatures**

a) would decrease the fluid flow
b) would not effect the fluid flow
c) would increase the fluid flow
d) would block the fluid flow

16. **The field heating device for the formation heat treatment process**

a) can be made of an electrical resistance heating element
b) can be made of an optical resistance heating element
c) can be made of a neutral resistance heating element
d) can be made of a positive resistance heating element

17. **A significant increase in permeability can be achieved in cores**

a) exposed to 249 degrees Centigrade vapor
b) exposed to 449 degrees Centigrade vapor
c) exposed to 649 degrees Centigrade vapor
d) exposed to 849 degrees Centigrade vapor

18. **The intense heating process can be used to**

a) increase the permeability of cores taken from heavy gas reservoirs
b) decrease the permeability of cores taken from light gas reservoirs
c) increase the permeability of cores taken from light gas reservoirs
d) decrease the permeability of cores taken from heavy gas reservoirs

19. **The heating process could be designed for**

a) cased holes
b) open holes
c) vertical holes
d) All of the above

20. **The injection gas in the formation heat treatment process heats up**

a) the downhole heater
b) the formation
c) the drill bit
d) None of the above

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***** ANSWER SHEET *** U328** **APPLICATION OF HEAT TREATMENT TO ENHANCE PERMEABILITY IN TIGHT GAS RESERVOIRS**	**STATE BOARD COURSE NO. VALUE** **8 PDH** **Office Use Only**

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