

Comments on Grading

1. At least 25 questions should be answered.
 - a. Maximum 4 points/question | Minimum 0 points/question.
 - b. A subset of answered questions will be used to assess the final grade.
 - c. Answering more than 25 questions cannot hurt your grade.
2. Each question always has 4 correct choices. A correct choice means that the choice is selected correctly, i.e.
 - a. For each question you give your selection of all choices from the complete set (a b c d) that you believe answer the question. Every question has at least one answer from the four choices.
 - b. The choices you give that are believed to answer a question also implicitly give the selection of choices that you believe do not answer the question.
3. A correct choice for a question gives +1 point.
4. An incorrect choice gives 0 points.
5. Examples:

Question X. What defines a reservoir flow unit (RFU)?

 b

a. Connate water.	b. Flow barriers.
c. Porosity.	d. Compressibility.

Correct Answer: [b]

Your Answer: [b]

Points = +4(a b c d) = +4

Your Answer: [b c]

Points = +3(a b d) = +3 : choice (c) was wrong

Your Answer: [c]

Points = +2(a d) = +2 : choices (b c) were wrong

Your Answer: [a b c d]

Points = +1(b) = +1 : choices (a c d) were wrong

Your Answer: [a c d]

Points = 0 : all choices (a b c d) were wrong

Question X. Which are not conventional reservoirs?

 a b c d

a. Heavy oil.	b. Shale gas.
c. Naturally fractured.	d. Shale oil.

Correct Answer: [a b c d]

Your Answer [a b c d]

Points = +4(a b c d) = +4

Your Answer [a c d]

Points = +3(a c d) = +3 : choice (b) was wrong

Your Answer [a d]

Points = +2(a d) = +2 : choices (b c) were wrong

Your Answer [a]

Points = +1(a) = +1 : choices (b c d) were wrong

1. What defines a reservoir flow unit (RFU)?
2. What are the typical characteristics defining a RFU?
3. What are the types of wells used to produce oil and gas?
4. What are the most common types of enhanced oil recovery (EOR)?
5. What are the two categories of Improved Oil Recovery (IOR)?
6. What are the key characteristics defining a reservoir?
7. What are the main mechanisms of EOR?
8. What are the main reservoir fluid phases?
9. Can you have water below the free water contact?
10. What is the water saturation at the free water contact (FWC)?
11. Is the free-water contact equal to the hydrocarbon-water contact (HWC)?
12. What defines an aquifer in a petroleum reservoir?
13. What are transition zone characteristics?
14. What determines pressure vs depth in a reservoir?
15. Does gas pressure = oil pressure for a *saturated* gas-oil contact?
16. Which are not conventional reservoirs?
17. Which are conventional reservoirs?
18. What are characteristics of a heavy oil reservoir?
19. What are always important characteristics of depletion performance?
20. What are always important to depletion material balance $p_R(Q_p)$?
21. What are "Pot" aquifer characteristics with respect to p_R vs p_{Aquifer} ?
22. What is not important to Pot aquifer water influx?
23. What depletion characteristics result in exponential rate decline?
24. Darcy velocity is different than pore velocity due to?
25. Mobility ratio is usually given by the ratio of which two mobilities?
26. Water fractional flow (f_w) relation for water-oil system (v =Darcy velocity)?
27. Buckley-Leverett displacement results in what kind of saturation profile?
28. For a two-layer no-crossflow water injection two-well system with $k_1=200$ md, $k_2=100$ md, $\phi_1=0.2$, $\phi_2=0.1$, and $h_1=h_2$, water breakthrough occurs where/when?
29. After 50% recovery in a high-pressure gas reservoir where pot aquifer model is valid, what is average reservoir pressure compared with the same reservoir without aquifer?
30. For a pot aquifer with "water volume parameter" $M>0$, what are the characteristics of the total cumulative compressibility term c_e ?
31. Extrapolated p_R/Z vs G_p data for IGIP for gas reservoir with pot aquifer?
32. What is not a method to model reservoir recovery?
33. Decline curve analysis in boundary dominated flow implicitly "uses"?

34. Who combined boundary-dominated and infinite-acting $q(t)$ behavior?
35. Key quantities in J of the pseudosteady-state rate equation $q=J(p_R-p_{wf})$?
36. Key quantities in J' of the pseudosteady-state rate equation $q=J'(p_R^2-p_{wf}^2)$?
37. Fundamental laws used to derive the straight-line gas material balance?
38. The pseudosteady-state rate equation $q=J(p_R-p_{wf})+J'(p_R^2-p_{wf}^2)$ is used for?
39. $p_R=f(Q_p)$ represents a general equation for?
40. Producing gas-oil ratio vs time for solution gas drive (SGD) reservoirs?
41. Oil mobility at average reservoir pressure for depletion in SGD reservoir = $f(t)$?
42. Average reservoir pressure during depletion in SGD reservoir = $f(t)$?
43. Borthne-Walsh general SGD material balance is a function of?
44. Multi-phase steady-state flow assumptions?
45. Multi-phase steady-state flow assumptions for gas condensates?
46. Rate-time forecasting related to?
47. Rate-time forecasting quantification and uncertainty?
48. Field rate-time forecasting dependent on?
49. Layered no-crossflow well and field depletion behavior?
50. Layered no-crossflow well and field depletion behavior?
51. Layered no-crossflow well and field depletion behavior?
52. Water Influx consequences?
53. Water influx impact on estimated ultimate recovery (EUR) – gas vs oil?
54. Water influx model types?
55. Parameters affecting rate decline curve performance?
56. Decline curve analysis parameter b ?
57. Decline curve analysis parameter D ?
58. Decline curve analysis parameter q_i ?
59. Decline curve analysis plotted on semi-log of rate vs time ($\log q$ vs t)?
60. Generalized Fetkovich decline type curves?
61. Generalized Fetkovich decline type curves p_{wf} boundary conditions?
62. Generalized Fetkovich decline type curves?
63. Generalized Fetkovich decline type curves?
64. Residual oil saturation range?
65. Residual oil saturation S_{or} for “gas” (S_{org}) vs “water” (S_{orw}) displacement?
66. Residual oil saturation dependence on capillary number ($N_c=v_p/\sigma$)?
67. Buckley-Leverett water saturations in water displacing oil?

- 68.** Saturation definitions (piston | leaky piston) in water displacing oil?
- 69.** Buckley-Leverett 1D vertical flow, injection from below?
- 70.** Buckley-Leverett displacement?
- 71.** Buckley-Leverett displacement used in which layered models?
- 72.** Buckley-Leverett displacement theoretical foundation?
- 73.** Layer permeability variation models?
- 74.** Layer permeability variation models?
- 75.** Layer permeability variation models vs single-layer homogeneous model?
- 76.** Voidage Replacement?
- 77.** Developed miscible gas injection EOR?
- 78.** Developed miscible gas injection EOR phase behavior issues?
- 79.** Purely Immiscible gas injection EOR recovery mechanisms?
- 80.** Developed miscible gas injection EOR?