

QUIZLET QUESTIONS

Romans 8:37 "No, in all these things we are more than conquerors through him who loves us"

***Some Answers have been updated**

1. What chemical found in TNT is also found in oil, particularly Borneo crude? Toloul
2. What is the term for the vented or drained off fluids from a pressured well? Bleed Off
3. Name Five types of Packers used in the oil industry? Compression set packer, drillable packer, hook-wall packer, inflatable packer, hydraulic packer
4. This volume of gas has been separated from produced water Blue gas
5. What is a raised metal lip that is around a perforation? Burr
6. what is the area of the rock adjacent to the perforation tunnel where permeability may be 50% less than initial, undamaged permeability? Crush Zone
7. This term describes the difference between average reservoir pressure and the flowing bottom hole pressure. Drawdown
8. This type of drawdown is the pressure differential from the formation near the wellbore to the wellbore - Completion Drawdown
9. This is a rubber or plastic material used as a seal - Elastomer
10. In the USA, this type of well is defined as producing 10 BOE/d or less - Stripper well
11. Describe what a z factor is also give the equation for it. The "z" factor is the ratio of the volume actually occupied by a gas at a given pressure and temperature to the volume the gas would occupy at the same pressure and temperature if it behaved like an ideal gas. $Z = V_{ACTUAL} / V_{IDEAL}$
12. What is the equation for gas specific gravity? $Y_g = Y / Y_{air}$
13. What do the variables represent in the gas specific gravity equation? Y_g is the specific gravity of the gas? g is the density of the gas, and air is the density of dry air.
14. What would the pressure be in a black oil reservoir at discovery? Either above the bubble point or equal to the bubble point pressure
15. What are the two types of chemical bonds? Covalent and ionic bonds
16. What is a vessel used to treat or separate water-oil emulsions? Heater Treater
17. In offshore operations, what does FPSO stand for? Floating Production, Storage, and Offloading Vessel
18. What is vessel used to separate gas oil and water after the mixture is produced from the well? Separator
19. What is the unused world oil production capacity called? Spare Capacity
20. What type of well typically produces a few barrels of oil per day and accounted for 15 percent of total U.S. production in 1986? Stripper wells

21. What is the average world's water cut associated with oil production? 25%
22. Who is considered the world leader in deep-offshore production? Brazil's Petrobras.
23. Wildcatter's used to taste and classify oils as sweet, medium sour, and sour based on what property of oil? Sulphur Content.
24. What term is used to define a higher than expected production from existing oilfields possible due to improved management, adoption of more sophisticated and costly technologies or previous miscalculation? Production Creeping
25. What are the two possible ways single phase flow can be characterized? Laminar or Turbulent
26. The velocity profile is parabolic for what type of flow? Laminar
27. Assuming uniform pipe diameters, what will be the pressure drop due to kinetic energy for an incompressible fluid - Zero
28. When calculating relative pipe roughness, $\epsilon=k/d$, what is k ? Length of the protrusions on the pipe wall.
29. In two phase flow what is hold up? When the lighter phase flows faster than the denser phase.
30. What is bubble flow? Dispersed bubbles of gas in a continuous liquid phase.
31. What is slug flow? At higher gas rates, the bubbles coalesce into larger bubbles, called Taylor bubbles, that eventually fill the entire pipe cross section. Between the large gas bubbles are slugs of liquid that contain smaller bubbles of gas entrained in the liquid.
32. What is churn flow? With a further increase in gas rate, the larger gas bubbles become unstable and collapse, resulting in churn flow, a highly turbulent flow pattern with both phases dispersed. Churn flow is characterized by oscillatory, up and down motions of the liquid.
33. What is annular flow? At higher gas rates, gas becomes the continuous phase, with liquid flowing in an annulus coating the surface of the pipe and with liquid droplets entrained in the gas phase.
34. Which two phase pressure gradient correlation can be used for any pipe inclination and flow direction? Beggs and Brill
35. Why for two phase flow would an increase in the imposed well head pressure result in a proportionately larger increase in the corresponding bottom hole pressure? Because gas would be re-dissolved, increasing the density of the fluid in the wellbore.
36. What is the concept of a gas lift? Increase gas liquid ratio resulting in a reduction to bottomhole pressure
37. There exists a limiting gas liquid ratio, where the decrease in hydrostatic pressure will be offset by what? Increase in frictional pressure drop
38. The intersection of the IPR curve and VLP curve gives what result? Well deliverability
39. The integration of flow rate versus time results in what? Cumulative Production
40. The fluid recover from an under saturated oil reservoir depends entirely on what? The fluid expansion as a result of underground withdrawal and associated pressure reduction.
41. In Havlena and Odeh's application of the material balance what is m ? $m = \text{vol of gas cap} / \text{vol of oil}$

42. Graphing F vs E_o (underground withdrawals vs Oil Expansion) would result in a slope of what, for saturated reservoirs and with no gas cap - Slope of N , original oil in place
43. Which type of reservoir drive system is happening when a reservoir contains no gas cap but rapidly passes below the bubble point pressure after production commences - Solution gas drive
44. With two phase flow, why does the flow regime not affect the pressure drop in horizontal flow as it does in vertical flow? No potential energy contribution to the pressure drop in horizontal flow
45. Brill and Beggs described three flow regimes for horizontal gas-liquid flow, what are they? Segregated flow, intermittent flow, and distributive flow
46. What is segregated flow? The two phases are for the most part separate.
47. What is intermittent flow? Gas and liquid phase alternates
48. What is distributive flow? One phase is dispersed in the other phase.
49. What are the three types of segregated flow? Stratified, Wavy and annular.
50. What are the two types of intermittent flow? Slug and Plug.
51. What are the two types of distributive flow? Bubble and mist.
52. How are the effects of valves and fittings included when calculating the pressure drop? Adding the equivalent length to the actual length
53. What is critical flow through a choke? When the fluid is accelerated enough to reach sonic velocity in the throat of the choke
54. What is the device inside the choke that restricts flow called? The bean
55. Why must a reservoir sample be taken before production in new wells? Once the reservoir drops below bubble point it is no longer possible to acquire a fluid sample from which the hydrocarbon composition can be determined.
56. Interpretation of a stabilized well test yields what information? Average reservoir pressure in the well drainage area, and the well productivity or injectivity index.
57. When can a stabilized well test be conducted? During steady state flow or pseudo steady state flow
58. How is the productivity index calculated? Well flow rate q , divided by the drop in pressure from the average reservoir pressure, p , to the flowing wellbore pressure p_{wf} .
59. If the productivity of a well is low due to low permeability, how is this overcome? Hydraulic fracturing
60. What is a drawdown test? Opening a well to flow after a shut in.
61. What is caused by movement, expansion, and/or compression of wellbore fluids in response to a pressure change? Wellbore storage
62. On a log log plot of flow rate vs time, what characteristic describes storage? A hump in the pressure derivative
63. Why is the use of down hole shut-in recommended in pressure build up tests? To avoid loss of early time data that may help to characterize damage and to avoid error in the test interpretation.
64. What are derivative responses that are commonly found and readily recognized in transient test data termed? Flow regimes
65. During wellbore storage flow regime, what is the slope of the pressure derivative. One

66. For a finite conductivity vertical fracture flow regime (bilinear flow), the pressure change and derivative are offset by a factor of what? Four
67. For an infinite conductivity vertical fracture flow (linear flow) flow regime, what is the slope of the pressure change? 0.5
68. The partial penetration (spherical flow regime) occurs between well bore storage and what other flow regime - Infinite acting radial flow
69. During infinite acting radial flow, what is the value of the pressure derivative slope? Zero
70. During pseudo steady state flow, the slope of the pressure change is 1 during which type of well test? Drawdown
71. For a late time, drawdown, the pressure change and pressure derivative are overlain for what flow regime? Pseudo steady state
72. Which two flow regimes cannot be separately distinguished in pressure build up data? Pseudo steady state and steady state
73. What is the oilfield unit for Wellbore storage, C? bbl/psi
74. This pressure is defined as the non-wet phase pressure minus wetting phase pressure in the interface between two immiscible fluids - Capillary Pressure
75. This type of permeability is a measure of the conductance of a porous medium for one fluid phase when the medium is saturated with more than one fluid. What is the name of this type of permeability? Effective permeability
76. In the majority of sedimentary basins, the overburden pressure increases linearly with depth. In psi/ft, what is the typical value of this gradient? 1 psi/ft
77. What is the term for the ratio of the resistivity of a rock filled with water to the resistivity of that water? Formation factor
78. Contact angle is used to measure the wettability, the solid is called water-wet if the contact angle is below ____ and is oil-wet if the contact angle is more than ____? 90, 90
79. What is k_{ro} and how is it defined? Oil relative permeability? $k_{ro} = k_o/k$
80. What is the term for a formation with constant permeability and no high or low 'streaks'? Homogeneous
81. What is the term for a gas that is a vapour in the reservoir and has no liquid dropout because separator conditions are still in the vapour region of the phase diagram? Dry gas
82. Real gases have a factor that is used to relate the gas to ideal conditions, what is the name of this factor? Gas deviation, or 'z' factor
83. If the contact angle between oil and water of a liquid on a core sample is less than 90°, what is the wetting phase? Water
84. What is the term for the equilibrium point between the sublimation line, the melting point line, and the vapour pressure line? The triple point
85. Name the five reservoir fluids? Black oil, volatile oil, retrograde gas, wet gas, and dry gas
86. The motion of atoms and molecules in fluids due to the temperature of a fluid appears to be random but is described by the relationships derived by the man for which this motion is named. What is the name of this motion? Brownian motion
87. The amount of oil that can be produced from a reservoir under current economic conditions is said to be what? Recoverable oil
88. What is the total amount of oil located in the subsurface of a reservoir of an oil field? Oil in place

89. Sonic Log, Density log and Neutron logs are all what type of logs in Well Logging?
Porosity Logs
90. What is the Material Balance Equation? $\text{Production} = \text{Expansion} + \text{Influx} + \text{Injection}$
91. What is the linear flow form of Darcy's Law? $q = ka(p_1 - p_2) / \mu L$
92. What is the conversion factor to obtain field units for Darcy's Law? 1.127×10^{-3}
93. Name at least four assumptions of Darcy's Law? Laminar flow, viscous flow, incompressible flow, steady state, homogeneous formation, 100% saturation with flowing fluid phase.
94. What does the term "dead oil" describe? Oil with no dissolved gas
95. What are three types of non-Newtonian fluids? Psuedoplastic (shear thinning), dilatant (shear thickening), and Bingham plastic fluids
96. What is the term for the effect of gas slippage at low pressure and is the cause for overestimation of absolute permeability in a gas saturated core? Klinkenberg effect or slippage effect
97. What process is used to determine the pore size distribution in a formation sample? Inject the sample with mercury then plot a graph of capillary pressure vs. water saturation
98. What is indicated by low pore entry pressure? The formation has large pores since low pressure is needed for a fluid to enter the formation
99. What does the term, B_g , represent? Gas formation volume factor
100. Will a SP log spike lower or higher in a reservoir containing hydrocarbons? Lower
101. What symbol is used to represent solution gas-oil ratio? R_s
102. What well log can be used to determine both the porosity and lithology of a reservoir? Resistivity log
103. What three well logs can be combined to determine the mineral composition of a formation? Acoustic, neutron, and density
104. What well log is used to determine both total and effective porosity? Magnetic resonance imaging tool
105. What is the name given to a reservoir with no apparent outer boundary limit affecting fluid flow during a test period? Infinite-acting reservoir
106. What factor is a correction for the Darcy Equation that accounts for changes in pressure and fluid saturation along a fracture? Beta Factor
107. This term describes the movement of water upwards or gas downwards towards a decrease in pressure caused by producing hydrocarbons in a zone with no vertical permeability boundaries? Coning
108. This term, often used in relation to EOR flooding, describes the effect of one fluid flowing through a porous media and displacing fluid of a different viscosity? Fingering
109. This type of tertiary recovery method involves injecting air into the formation and igniting the oil? Fire Flood
110. What type of EOR method uses the flooding of the oil reservoir from the top of the reservoir or from an up dip location in order to push the oil towards a producing well? Gas Flood
111. What is the absorption of fluids into the pores of a rock? Imbibition

112. This fraction of the pore space occupied by water when the hydrocarbon content is at its maximum. This level of water can only be reduced by flow of a very dry gas that evaporates the water? Irreducible water Saturation
113. Who was a correspondent for Petroleum Week and the founder of Petroleum Intelligence Weekly? Wanda Jablonski
114. In 1960 who became the new chairmen of the Standard Oil of New Jersey? Monroe Rathbone
115. On what date did shell offer an olive branch by raising its oil prices by two to four cents? September 8, 1960
116. OPECS five original founders accounted for what percentage of the world's oil exports? 80%
117. Which law in 1959 encouraged exploration and development of oil in the Libyan Desert? Libyan Petroleum Law of 1955
118. In what year did Wanda Jablonski first publish Petroleum Intelligence Weekly? 1963
119. According to Yergin, who worked as a superintendent of a school system in New Orleans and single headedly started the oil industry? George Bissell
120. Which Yale professor first analysed Rock Oil for its properties as an illuminator in a paper dated April 16, 1855? Dr. Benjamin Silliman Jr.
121. What was the name of the company that George Bissell founded for the exploration and refining of petroleum into kerosene? Pennsylvanian Rock Oil Company
122. In his own mind this person claimed "to have bored the first well that ever was bored for Petroleum in America? Colonel" Edwin L. Drake
123. In February 1865 John D. Rockefeller bought out this man, his partner of a successful oil refinery in Cleveland, Ohio, for \$72,000. Name this man - Maurice Clark
124. What is the term used to describe a high quality low sulphur oil? Sweet
125. In what year did Libya become the 6th largest exporter of oil in the world? 1965
126. In the United States what organization managed and restricted the production of oil in Texas? The Texas Railroad Commission
127. Who originally created the Iraq Oil Company? Calouste Gulbenkian
128. What amendment to the 1955 trade act gave the president the ability to restrict oil imports? National Security Amendment
129. What was the average price of oil at the well head in the United States in 1968? \$2.94
130. The second half of the 20th century was referred to as what? The Age of the Hydrocarbon Man
131. In 1957 England's parliament passed what act that favoured the use of oil? Clean Air Act
132. In 1971, oil and natural gas provided what fraction of the total worlds energy? 2/3
133. In the 1950's three oil companies including Continental, Marathon and Amerada went to Libya and formed a coalition know as what? Oasis Group
134. In what year did the Supreme Court finally order the Standard Oil Company to dissolve due to the Sherman Act? May, 1911
135. In the dismantling of Standard Oil how many smaller companies did they divide up into? 7
136. Which of the seven-subset companies that Standard Oil broke up into retained the most power and what is the company name today? Standard Oil of New Jersey
137. Who was the man that revolutionized the Petroleum Industry by breaking down large hydrocarbons with thermal cracking? William Burton

138. Which company emerged from the Samuel's Syndicate in 1897? Shell Transport and Trading Company
139. What is the name of the man that was responsible for the survival of Royal Dutch in 1900? Jean Baptiste August Kessler
140. Who took over as the "interim manager" for Royal Dutch in December 1900 and retained that position for 35 years? Henri Deterding
141. In December 1901 which company did the Shell Group merge with (to form British Dutch)? Royal Dutch
142. In what year did the Shell Transport Royal Dutch Petroleum Company, "British Dutch", draft an agreement with the Rothschilds? June 1902
143. In November of 1902 who was it that obtained the great honour of Lord Mayor of London? Marcus Samuel
144. When the Asiatic Petroleum Company was constructed in July 1903, who was is that took over as chairman for the company? Marcus Samuel
145. Who was the Dutch Engineer who had rescued Royal Dutch with new discoveries in Sumatra? Hugo Loudon
146. Who was the man that first organized Shell's storage tanks in the Far East in the early 1890's and also helped set up productions in Borneo in the late 1890's? Mark Abrahams
147. What is the name of the group in Russia that tried to prevent revolution by means of killing Christian Armenians? Moslem Tartars
148. What was the event that sparked the revolution of 1905 in Russia that nearly collapsed the Russian oil industry? Bloody Sunday December 1904
149. In what year did the Rothschilds and Royal Dutch/Shell merge together? 1912
150. In what year did the reign of General Gomez come to an end in Venezuela? 1935
151. In the 1930s oil was this percent of Venezuela's export value - 90%
152. Who was President of Pantepec Oil Company in 1943? William F. Buckley
153. What organization ruled Venezuela in the mid-1940s? Accion Democratica
154. What does Aminoil stand for? American Independent Oil Company
155. What price did J. Paul Getty pay for his part in Saudi Arabia? 9.5 million US dollars
156. This is the name for the disputed border between Saudi Arabia and Kuwait - The Neutral Zone
157. In 1957 Fortune magazine said this man was the richest person in America - J. Paul Getty
158. In this year Saudi Arabia finally received a "fifty-fifty" deal with Aramco - 1950
159. In what year did executive from five oil companies meet at Achnacarry Castle in Scotland to draft the 'Pool Association' or 'As-Is' agreement? 1928
160. Who became the chairman of Anglo-Persian in 1927? Sir John Cadman
161. In 1930, what companies were known as the 'Big Three'? Jersey (Standard Oil of New Jersey), Shell, and Anglo-Persian

162. The 'As-Is' agreement was modified several times to attempt to improve effectiveness. One particular revision was especially effective in bringing stability to the industry. What is the name given to a looser cooperation agreement, devised in 1934, that was a revision of the 'As-Is' agreement? Draft Memorandum of Principles
163. What year did CUSS 1 drill the first deep sea hole in 3,800 meters of water off Guadalupe Island, Mexico? April 1961
164. Which oil company began in 1929 after a merger between a Rocky mountain company which was part of Standard oil and an Oklahoma based crude producer? Continental Oil Company
165. Out of the original 5 Billion dollars that Exxon was supposed to pay for the Exxon Valdez oil spill, how much did Exxon settle to pay? 507.5 million
166. What year did the United States reach peak oil production of 11.3 million barrels a day? 1970
167. On December 26, 1967 the largest oil field in North America was discovered. What is the name of this field? Prudhoe Bay, Alaska
168. Who built Occidental Oil Company into one of the world's great energy companies in late 1960s? Dr. Armand Hammer
169. What was the nick name the chairman of Occidental, Armand Hammer? The Doctor
170. Which USA president gave the first ever Presidential address on energy in April of 1973? Nixon
171. What decade marked the end of the 20-year surplus of oil? 1970s
172. What caused the Texas Railroad Commission to allow all out production at 100 percent of capacity of oil fields in 1971? Diminishing surplus of oil and increasing demand for oil in the United States.
173. During what decade did free world oil demand grow by 21 million barrels per day? 1960 - 1970
174. What region supplied 2/3 of the world's oil in 1960-1970? Middle East
175. What action was taken in 1969 in response to an offshore oil leak in Santa Barbara which expired in 2008? A moratorium was imposed on California offshore development.
176. In the late 1930's what percentage of oil consumed in Japan was produced by the Japanese? 7%
177. In the late 1930's what percentage of oil was imported by the Japanese from America? 80%
178. Who was the Oil Administrator that met with Henri Deterding and Walter Teagle in Washington, D.C. in August 1934? Harold Ickes
179. What law was created by the Japanese government that would last seven years and was aimed at producing synthetic fuels made out of coal that would supply half of the oil that the country consumed? Synthetic Oil Industry Law

180. On July 2, 1940 Franklin Roosevelt signed which law that gave the president the ability to control the flow of exports including oil? National Defence Act
181. In July 1940, a ban was placed by the USA on oil exports to the Japanese but was not a complete ban on oil exports. This ban only prohibited the exportation of what octane or higher of fuel? 87 Octane
182. Who was the Japanese General who was the mastermind behind Pearl Harbour? Admiral Isoroku Yamamoto
183. Who became prime minister of Japan on October 18 1942? Hideki Tojo
184. What vehicle was designed by the Germans and was known as the people's car? Volkswagen
185. What style of faulting may occur when the Horizontal Stress in one direction is greater than the horizontal stress in the perpendicular direction? Strike-Slip faulting
186. Name a source of vertical stress - Overburden
187. Name a source of horizontal stress - Poisson's Ratio Effect or Tectonic Stresses
188. Name 3 of the 4 types of clastic fragments in limestone - Oolites, Intraclasts, Fossils, and Pellets
189. What type of sandstone is characterized by being impure or dirty? Graywacke
190. A sandstone containing highly viscous, asphalt-like hydrocarbon compounds is referred to as what? A tar Sand
191. A non-clastic limestone, characterized by loosely consolidated, earthy calcium carbonate and clay containing deposits of shell - A marl or marlstone
192. Volcanic tuff altered to montmorillonite is called what? Bentonite
193. What are 3 of the different dolomitization models? Evaporative, Seepage Reflux, Mixing-Zone, Burial, Seawater
194. The process of breaking down chemical bonds in kerogen and clays within shale to generate liquid hydrocarbons - Catagenesis
195. Algal and amorphous kerogen highly likely to generate oil is what type? Type I
196. Mixed terrestrial and marine source material that can generate waxy oil is what type? Type II
197. Woody terrestrial source material that typically generates gas is what type of kerogen? Type III
198. Kerogen containing mostly decomposed organic matter also known as charcoal is what type of kerogen? Type IV
199. Volcanic tuff altered to montmorillonite is called what? Bentonite
200. Sandstone containing highly viscous, asphalt-like hydrocarbon compounds is referred to as what? Tar Sand
201. What was the first major contribution of geology to oil exploration? The Anticline Theory
202. A major oil discovery in what state confirmed the anticline theory? Oklahoma
203. In what year was a major oil discovery made that confirmed the anticline theory? 1913

204. A study by the US Bureau of Mines around 1917 concluded that this method would increase oil recovery - Natural Gas Injection
205. What group did a study that marked the first intuition into secondary recovery of oil? US Bureau of Mines
206. What theory did the Soviet school of geology supported claiming oil could be made without the help of living organisms? Abyssal Abiogenic (or Abiotic) Theory
207. The Abyssal Abiogenic (or Abiotic) Theory led to discoveries of oil where? In Non-sedimentary, crystalline basement rock scores of hydrocarbons
208. In terms of oil formation, what is the oldest geological era? Jurassic
209. What is the equation for the Traction Vector? stress tensor times unit normal vector
210. what gives the state of stress at any point? Stress Tensor
211. Three mutually perpendicular normal stresses in a coordinate system where all shear stresses vanish defines what? The Principal Stress
212. What constant is used to directly relate strain and stress? Young's Modulus or Elastic Modulus or Tension Modulus
213. What is a mathematical description of continuous physical phenomenon in which a dependent variable is a function of more than one independent variable? Partial Differential Equation
214. This numerical model requires only discretization of the boundary? Boundary Element Method
215. This numerical model has a solution procedure based on numerical approximation of the governing equations - Finite Difference Method
216. This numerical model has a solution procedure that exploits approximations to the connectivity of the elements and to the continuity of stress and displacements between the elements - Finite Element Method
217. Name two methods to obtain $Ku+f=0$ from an approximate solution - Galerkin, Variational Principles (Raleigh-Ritz)
218. What substitutions are made for the method of weighted residuals? $u=\sum N_a u_a$ and $v=\sum w_b \delta u_b$.
219. What substitution is made in Galerkin's Method? $w_b = N_b$
220. Integral statement of a PDE multiplied by a weighting function and equated to 0 - Weak Form
221. A PDE that describes a physical process and has BC's that are essential and/or natural - Strong Form.
222. As opposed to the standard discrete system, the more general Finite Element method utilizes what? Approximations
223. Euler's Equations are equivalent to what? The strong form.
224. What is a graph which plots the percentage (by volume) of a given grade of crude which boils off as a function of temperature? Distillation curve

225. In the petroleum coking process, what is the length of time it takes to heat the coke drum sufficiently to safely introduce hot hydrocarbons, transform the raw material into solid petroleum coke, and remove or cut the solid coke from the drum before repeating the process? Drum cycle
226. Which type of contract is a Contract by which the production of a field is shared between the host government and the oil company operating the field? Production sharing agreement
227. Who are the CEOs of Schlumberger, Halliburton, Baker, and Weatherford? Paal Kibsgaard, Jeff Miller, Lorenzo Simonelli and Mark McCollum
228. What country in Europe has the most oil reserves excluding Russia? Norway. Then UK, Denmark, Romania, Italy.
229. Where is Statoil headquartered? Stavanger, Norway
230. Headquartered in Rome, Italy, what is the largest Italian oil and gas company? ENI S.p.A
231. Who are the CEOs of ENI and Statoil? Claudio Descalzi and Eldar Saetre
232. What is the largest offshore gas platform in the world? Troll A. In Norwegian waters, North Sea and operated by Statoil.
233. What field has been injecting CO₂ for storage since 1996? Sleipner West, Norway. Operated by Statoil, stores about 1 million tonnes per year.
234. What is the name of the largest natural gas company in the world? Gazprom (33.1 TCF)
235. Who was SPE's first President? John Hammond
236. what year did SPE become a professional society? 1957
237. Who was the first woman president of SPE? DeAnn Craig
238. In what year was the first woman president of SPE in office? 1998
239. Refineries with cracking units are commonly referred to as what? High-Conversion.

240. Up to what depth of water are jack up rigs able to drill in? 400 ft (120 m) +/- 50
241. What are the 3 types of platform rigs? Steel-Jacket platform, caisson type, concrete gravity type
242. Platform rigs situated in deep waters need to be able to yield to the movement of water and wind. What two types of systems accommodate these movements? Guyed-tower rigs and tension-leg rigs
243. To what approximate depth of water are submersible rigs able to drill in? 175 ft (just over 50 m) +/- 25
244. What are 2 types of submersible rigs? Posted barge submersible, Bottle-type submersible, Arctic submersible
245. What term is used to refer to the use of thrusters to keep a semisubmersible rig over the drill hole? Dynamic Positioning
246. When the wellhead and blowout preventers are mounted on the seafloor what connects the blowout preventer to the rig? Marine Riser
247. To what depth of water is a semisubmersible rig capable of drilling in? ~7500 ft ~(2200 m)

248. What types of rigs usually utilize a subsea blowout control system? Drilling ships and semisubmersibles
249. What is the most poisonous gas encountered in drilling operations - H₂S (Hydrogen Sulphide)
250. What rig instrument helps the driller monitor the amount of mud being displaced by the tubular or wire rope being run in and pulled out of the hole? Trip Tank Volume Indicator
251. What shows the revolutions per minute, or RPM, of the rotary table or top drive unit? Rotary Tachometer
252. What shows the number of times one mud pump piston moves per minute? Pump Rate Gauge
253. What is the term given to a drilling rig's main power source? Prime Mover
254. What do drillers use as a relative indicator of how much drilling fluid is returning at the flow line? Mud Return Flow-Rate Indicator
255. Saturated hydrocarbons, with a general formula C_nH_{2n+2} are known as what? Paraffins or alkanes
256. What are the three subgroups of hydrocarbons? Paraffins/alkanes, Naphthenes/cycloalkanes, and aromatic compounds
257. What is the term for disseminated organic matter in sediments that is insoluble in normal petroleum solvents? Kerogen
258. With a higher proportion of hydrogen relative to oxygen than other types and a Hydrogen: Carbon ratio of about 1.65, name the type of kerogen that has lipids as the dominant compounds, with derivative of waxes, fats, and oils? Type I
259. The Kimmeridge clay of the North Sea and the Tannezuft shale of Algeria are of this type. The original organic matter of this kerogen consisted of algal detritus, but also contained material derived from zooplankton and phytoplankton - Type II
260. By the 1920's the oil industry was dominated by seven major companies, termed the "seven sisters" by Enrico Mattei. What were the names of the European companies included in this group - Anglo Persian Oil Company, Royal Dutch Shell, SOCONY, Standard Oil of New Jersey, SOCAL, Texaco and Gulf Oil Company
261. Gas hydrates are compounds of frozen water that contain gas molecules. What is the term for the molecules themselves? Clathrates
262. A mixture of hydrocarbons that existed in the liquid phase in natural underground reservoirs and remain liquid at atmospheric pressure after passing through surface separating facilities is known as what? Crude oil
263. In the study of petroleum fluids, which bonds are we most concerned with, covalent or ionic? Covalent
264. What is regarded as the normal valence angle of carbon? 109.5 degrees
265. Which hydrocarbon group is considered the most stable? Alkanes
266. What type of compound is benzene? Aromatic

267. This compound forms the largest group of nonhydrocarbons in petroleum.
 268. Sulphur compounds
 269. What point on a phase diagram represents the pressure and temperature at which solid, liquid, and gas coexist under equilibrium conditions? The triple point, equilibrium point
 270. Why are alkanes the main constituents of petroleum gas, as opposed to other hydrocarbons? Because they are the simplest molecules, making them the most stable
 271. Name two of the three performance attributes for evaluation of an underground storage reservoir - Verification of inventory, assurance of deliverability, containment against migration.
 272. In the field of production, what does the acronym UGS stand for? Underground gas storage.
 273. What does the equation $Q = PI(P_r - P_{wf})$? Inflow performance relationship (IPR)
 274. The measurement of the attractive forces of a mud while at rest or under static conditions is known as? Gel Strength
 275. These machines mechanically remove the sand/silt sized particles from the mud? Desander/Desilter
 276. The build-up of solids along the face of the wellbore while drilling, due to loss of fluids is called what? Mud Cake (filter cake)
 277. The major difference between the Bingham model and Newtonian fluids is? Bingham model has a yield point
 278. If a gel strength increases slowly over time what is its classification? Weak or Fragile
 279. What type of gel strength is most desirable for drilling? Fragile
-
280. What two gasses can cause changes in a muds pH? CO₂ and H₂S
 281. To avoid corrosion in the borehole what type of pH level is desirable? Low pH
 282. What is the first casing to be used while drilling? Conductor Casing
 283. Resources that will be potentially recoverable, as of a given date, by projects not currently considered commercially economic due to any number of circumstances - Contingent Resources
 284. Resources which are estimated, as of a given date, to be potentially recoverable from undiscovered accumulations - Prospective Resources
 285. A project associated with a potential accumulation that is sufficiently well defined to represent a viable drilling target - Prospect
 286. A project associated with a potential accumulation that is currently poorly defined and requires more data acquisition and/or evaluation - Lead
 287. A project associated with a prospective trend of potential prospects, but which requires more data acquisition and/or evaluation in order to define specific leads or prospects - Play
 288. Expected reserves to be recovered from existing wells and facilities - Developed Reserves

289. Reserves expected to be recovered through future investments - Undeveloped Reserves
290. Reserves are expected to be recovered from zones in existing wells, which will require additional completion work or future re-completion prior to the start of production - Behind-Pipe Reserves
291. A well found to be incapable of producing either oil or gas in sufficient quantities to justify completion as an oil or gas well - Dry Hole
292. Shale, siltstone and marl deposits highly saturated with kerogen - Oil Shales
293. Who is the 2011 SPE President - Alain Labastie
294. Name four SPE periodicals - JPT; J of Canadian PT; SPE D&C; SPE Econ & Mgmt; SPE Journal; SPE Prod & Op; SPE Res Eval & Eng; SPE Projects, Facilities, & Construction; The Way Ahead.
295. How much oil is consumed globally per day? 97 MMBBL
296. How much natural gas is consumed globally per day? 3.2 TCF
297. Who was sometimes known as the 'energy czar' in the early 20th Century? Mark Requa
298. Who was known as 'the man with the sledgehammer' in 1916 Rumania? Colonel John Norton-Griffiths
299. Which Russian oil field was saved from Germans by the British in August 1918 which led to the fall of Germany in WWI? Baku

300. What was the main factor which led to the fall of Germany in WWI? Lack of domestic oil
301. In what year did the Exxon Valdez oil tanker sink in the Prince William Sound, Alaska, USA? 1989 (March 24)
302. How much oil was spilled by the Exxon Valdez? 11 million gallons (261,900 bbls, 41,640 m3)
303. What is the name of the well on which the Deepwater Horizon exploded and sank in April 2010? MC252 (Macondo prospect)
304. How much oil is estimated to have been spilled by the blowout of MC252 in the Gulf of Mexico? 206 million gallons (4.9 million bbls, 779,794 m3)
305. What company produced the most oil in Mexico when the nationalization of the industry took place? Mexican Eagle
306. In 1938, how many countries combined to account for 94% of the world's oil production? 8 (USA, Roumania, Dutch East Indies, Russia, Iran, Venezuela, Mexico, Iraq)
307. When was the first oil shipped via the Big Inch pipeline? August 1943
308. What year did Colonel Drake strike oil? 1859
309. What was the total depth of the first well that Drake drilled that produced oil? 69.5ft
310. What was the name of the creek around Titusville Pennsylvania where oil was first drilled? Oil Creek
311. At what rate did the first flowing well in April 1861 flow? 3000 b/day

312. How many people died when oil from the first flowing well caught fire? 19
 313. What was the area around Cornplanter and Titusville known as? The Oil Region
 314. The largest oil spill ever recorded was deliberate in nature. In what year did this event happen? January 19th 1991
 315. How many gallons did the largest oil spill actually spill? 380-520 million gallons (450 million gallons avg)
 316. Where does the Deep Water Horizon oil spill rank on the world largest oil spills? 2nd
 317. In what country was the largest oil spill to date? Kuwait
 318. What year did the largest oil spill happen? 1991
 319. Who had the nickname Old Mossy? Mohammed Mossadegh
-
320. Who was known as the oil czar in WWII? Harold Ickes
 321. Who were OPEC's two founding fathers? Abdulla Tariki, Juan Pablo Perez Alfonzo
 322. Who was the first Saudi oil Minister? Abdulla Tariki
 323. What was Tariki's nick name? Red Sheik
 324. On what day did Exxon Valdez tanker go aground in Alaska? March 24, 1989
 325. What are the ABCD powers? America, Britain, China, and the Dutch
 326. In what year was Daniel Yergin's the Prize first published? 1991
 327. What was the name given to the oil boom of the late 1970s? Second Oil Shock
 328. What was the name of the TV show starring J.R Ewing which celebrated the late 1970s oil boom? Dallas
 329. What company bought into the Colony Shale Project on the Western Slope in Colorado in 1980 - Exxon
 330. What was the most severe year of the economic downturn following the Second Oil Shock? 1982
 331. In what year did the USA pass legislation demanding that cars double their fuel economy by 1985? 1975
 332. In what year did OPEC make its first reduction in oil production in an attempt to support prices? 1982
 333. In what year did OPEC cut prices from \$34/bbl to \$29/bbl? 1983
 334. Who was the CEO of BP in the early 1980s who promoted the deintegration of the company? P. I. Walters
 335. Who were the four Aramco partners - Chevron, Exxon, Mobil, Texaco
 336. What modern exchange first sold oil futures in 1983? New York Mercantile Exchange (Nymex)
 337. What crude was the benchmark crude for the first oil futures sold on the Nymex? West Texas Intermediate (WTI)
 338. What was the term given to describe the difference between the worth of reserve assets and the share price of oil companies in the early 1980s? The Value Gap
 339. What was the name of the company formed by the consolidation of T. Boone Pickens' drilling companies in 1969? Mesa Petroleum

340. What was the first company that Mesa Petroleum acquired (in 1980)? Hugoton Production
341. What company acquired Cities Service in 1982 resulting in a profit of \$30 million for Mesa Petroleum? Occidental
342. What were the 3 bases that oil was sold on in the 1870's? Spot; Regular; Futures
343. In what year did the Titusville oil Exchange open? 1871
344. This man became partners with Rockefeller in 1867 and would later found Miami and West Palm Beach - Henry Flagler
345. What was the group of railroad companies who raised freight prices in 1872 effectively starting the Oil War? South Improvement Company
346. In 1879 this first long distance pipeline (110 mi) was built in order to carry oil from the oil regions to the Pennsylvania and Reading Railroads - Tidewater Pipeline
347. What was the name of the German Chemist who was first able to take sulfur out of crude oil? Herman Frasch
348. To what was the president of Sohio's production company referring when he said, 'we drilled in the right place, we were simply 30 million years too late'? Mukluk, Alaska
349. The act of forcing, pumping, or free flow under vacuum, of substances into a porous and permeable subsurface rock formation.
350. Injection
351. What are payments due to the host government or mineral owner in return for depletion of the reservoir called?
352. Royalty
353. Natural gas contained in coal deposits, whether or not stored in gaseous phase.
354. Coalbed Methane
355. What is the name of locations in the production chain where the produced quantities are measured or assessed?
356. Reference Points
357. This is the process of adding new wells in an existing field within the original well patterns to accelerate recovery or to test recovery methods - Infill Drilling
358. What is the term for probability of loss or failure? Risk
359. What reservoir state exists when the pressure change with time varies with location? Unsteady or Transient State

360. Measuring the flow rate and pressure drawdown in a producing well while the reservoir is in steady states provides what information? Permeability or skin.
361. What reservoir state exists when there is no change in density at any position with the reservoir at a function of time? Steady-State
362. What reservoir state exists when the pressure change over time is the same everywhere in the reservoir? Pseudosteady-state
363. What are the laws of continuity used for most reservoir engineering applications? Conservation of mass, energy, and momentum

- 364.** What type of reservoir has the same properties in all directions at any location?
Isotropic Reservoir (not the same as homogenous)
- 365.** By measuring the time required for a mud sample to flow through a Marsh funnel, what can be determined about the sample? The viscosity
- 366.** What percentage of Sodium Chloride is required in a drilling fluid for it to be called a saltwater mud? 1%
- 367.** What is a mathematical tool used in petroleum engineering to assess the performance of a well by plotting the well production rate vs. the bottom hole pressure? Inflow Performance Relationship (IPR)
- 368.** What is the production rate divided by the pressure difference in a well? Productivity Index (J)
- 369.** What correlation allows for the use of properties for just oil if that oil is in a two phase system? Vogel Correlation
- 370.** A perforated height that is less than the reservoir height, an inadequate number of perforations, phase changes and turbulence can all cause what? Positive Skin Effects
- 371.** The difference between ideal Pwf and real Pwf is equal to what? The pressure drop due to skin.
- 372.** What device consists of a cable head, a correlation device, a positioning device and perforation guns? Perforating String
- 373.** What is a complex assembly of irregularly shaped minerals with void spaces which are likewise irregularly shaped and distributed? A porous medium
- 374.** What is the phenomenon that occurs from a sudden decrease in salinity of a brine flowing through a sandstone that will cause formation damage by dispersing clay particles? Water Sensitivity
- 375.** Total skin is composed of a number of components. Name three - Damage skin, skin due to partial completion and slant, perforation skin effect, pseudo-skins
- 376.** What is a scraping tool that is forced through a pipeline or flow line to remove accumulations of wax, and debris from the walls of the pipe? Pig
- 377.** What is the device that is used to convert mechanical energy to hydraulic energy within the liquid being lifted? Centrifugal Pump
- 378.** What is the continuous or intermittent injection of gas into the lower section of the production - Gas Lift
- 379.** What is the process where gas is injected under a column of liquid (usually above a standing valve) to displace that slug of liquid to the surface - Intermittent Gas Lift
- 380.** What is the name of the refining device where crude oil is separated into its components? Fractionation or fractionating column
- 381.** Rank the following in order from highest distillation temperature to lowest: Diesel fuel, gasoline, jet fuel, naptha - Diesel, jet fuel, naptha, gasoline.
- 382.** What percentage of a barrel of crude is converted to gasoline? 45-47%
- 383.** Name three Chinese NOCs - Sinopec, CNPCorp, CNOOCorp, PetroChina.

384. On a phase diagram, this is defined as the maximum temperature above which liquid cannot be formed regardless of pressure - Cricondentherm
385. What is the maximum pressure above which gas cannot be formed regardless of temperature - Cricondenbar
386. Who was the world's first billionaire? John D. Rockefeller (1916)
387. Better known as Dr. Seuss, this man worked as an illustrator in advertising campaigns for Standard Oil - Theodor Seuss Geisel
388. This is the pressure corresponding to the maximum temperature above which liquid cannot be formed regardless of pressure - Cricondentherm pressure
389. This is the temperature which relates to the maximum pressure above which gas cannot be formed regardless of temperature - Cricondenbar temperature
390. Who led the "initial crusade" to uncover the Teapot Dome Scandal? Robert La Follette
391. The first gas station to start handing out maps of the region was located where? Pittsburgh, PA
392. What oil field was one of three fields set aside as "naval oil reserves" and later transferred to Interior Department and leased to private companies? Teapot Dome
393. This man took control of the Teapot Dome field from the Navy Department and leased the reserve to Harry Sinclair in 1922 - Senator Albert B. Fall
394. During the Teapot Dome Scandal this company was determined to be a mechanism by which prominent oil men received kickbacks in the form of governments Liberty Bonds on purchases of oil - Continental Trading
395. Up to the 1920s the mapping and identification of likely prospects was based on the visible landscape. What is this type of geology called? Surface Geology
396. This instrument measures the changes in gravity from point to point on the surface and was adapted from World War I technology - Torsion Balance
397. This innovation from World War I was used to measure changes in the vertical components of the earth's magnetic field - Magnetometer
398. This geophysical technique in which a charge is set off resulting in energy waves that travels through subsurface structures was first introduced in 1923-1924 - Refraction Seismology
399. What is the name given to the "listening ears" used in refraction seismology? Geophones (jugs)
400. In June 1921, this Shell exploratory well discovered Signal Hill - Alamos Number 1
401. In what year did American crude oil production exceed domestic demand for the first time in a decade? 1923
402. In response to the warnings of Henry Doherty, Calvin Coolidge created this board to investigate the conditions in the oil industry - Federal Oil Conversation Board
403. What company later named Marathon had been the largest of Standard Oil's producing companies before the 1911 dissolution? Ohio Oil Company
404. What prevents a hole of a well from caving in, and seals off formations? Casing
405. What device helps the casing past rough spots and edges in the wellbore? Guide Shoe
406. What device keeps the casing from leaning against the sides of the hole? Centralizer

407. What joint of casing is used as a one-way valve? Float Collar
408. The primary purpose of which casing string is to seal off freshwater zones? The surface casing string
409. What device can be used to prevent differential sticking? Centralizer
410. Which casing string is used to support the BOP stack? The Surface Casing
411. Reservoir Rock, Seal, and 3 Dimensional Closure are three important features of what? Traps
412. A type of listric normal fault where sediment infilling at the surface has kept pace with the fault movement such that the hanging wall has a thicker sequence than the foot wall - Growth Fault
413. In volumetric calculations what device when used on an isopach map can mechanically measure the area inside circumscribed lines? Planimeter
414. If the combination neutron-density log is good for telling oil from gas, how do you tell oil from water? Resistivity log
415. What psi/ft gradient is used for fresh water? 0.433 psi/ft
416. What psi/ft gradient is used for pore pressure along the US Gulf Coast? 0.465 psi/ft
417. What is the total sum of openings or voids that occur within a rock? Porosity
418. What is the total sum of interconnected openings or voids that occur within a rock? Effective Porosity
419. The percentage of non-wetting phase (usually oil or gas) left in the ground after production – Residual

420. The percentage of effective porosity occupied by the wetting phase fluid that cannot be removed - Irreducible or Connate
421. When was the first rock bit with jet nozzles used? 1942
422. When was the first insert bit introduced? 1949
423. Who introduced the first insert bit? Hughes Tool Company
424. What was the first insert bit nicknamed? The Chert bit
425. When was the first PDC bit used? 1979
426. What are the three parts of a diamond bit? Diamonds, matrix and shank.
427. What type of teeth on a roller cone bit provides the greatest amount of surface area and are used in abrasive formations? "T" type
428. Named for the weather phenomenon which it resembles, what type of plot is used to correct deep log resistivity to true formation resistivity? Tornado Chart
429. What's the term for fail-safe valves that are designed to prevent an uncontrolled release of hydrocarbons from the well if something catastrophic occurs at the surface? Subsurface Safety Valves
430. Which aquifer model is based on the premise that the water influx rate is directly proportional to the pressure drop between the average aquifer pressure and the pressure at the reservoir-aquifer boundary? Fetkovich
431. Which two phase pressure gradient correlation can be used for any pipe inclination and flow direction? Beggs and Brill

432. Perforating with a casing pressure less than reservoir pressure is a conventional approach to avoiding plugged perforations, what type of perforating is this?
Underbalanced
433. A positive displacement motor is a hydraulically driven down hole motor that uses what principle to rotate the bit? Moineau Principle
434. Archie's equation has two factors based off the formation type, tortuosity factor, n , and cementation exponent, m . When there is no knowledge of the local parameters, values of 1 and 2 can be assumed for n and m , respectively. For what formation lithology are these values correct? Carbonates (limestone or dolomite)
435. What precipitate is formed when hydrofluoric acid reacts with calcium carbonate?
Calcium Fluoride (CaF_2)
436. If the API gravity of a crude oil is 40° , what is the specific gravity of that oil? 0.825
437. Name four assumptions of Darcy's Law - Laminar flow, viscous flow, incompressible flow, steady state, homogeneous formation, 100% saturation with flowing fluid phase.
438. When operating offshore, drill string is run down special piping known as the marine riser. On the exterior of the marine riser are two additional pipes used for well control. For ten points each, what are these pipes? Choke lines and kill lines
439. Salt domes go through three major stages of development. For 20 points, what are these stages? Pillow stage, True Peircement stage, Post-diapiric stage.
440. A change in the volume, pressure, or temperature of a gas, occurring without a gain or loss of heat - Adiabatic Change (page 3)
441. A condition in which the weight on a bit tooth has been so great that the tooth has dulled until its softer inner portion caves over the harder case area - Bradding
442. Slang term used to describe moderate to severe flocculation of mud due to various contaminants, also called gelled-up - Clabbered
443. A process of molecular bridging of polymers with other chemical substances that alters viscosity and shear rates to enhance lifting of bit cuttings and increase drilling rates - Cross linking
444. Slang term used for some who prospects for oil using seismology - Doodlebug
445. The procedure of recovering lost or stuck equipment in the wellbore - Fishing
446. Abnormally high pressure exerted by some subsurface formations - Geopressure
447. Water contained in the pores of a reservoir rock - Interstitial water
448. Slang term referring to the member of a seismograph crew who places the geophones - Jug hustler
449. An explosive charge detonated in the borehole to break up large pieces of junk in order to facilitate the junk's removal from the hole - Junk shot
450. Commonly a bullet-nosed shaped device. What device is installed at the bottom of the casing string? Guide Shoe, Float Shoe, or Casing Shoe
451. What type of flow occurs when the individual particles in a fluid move forward in straight lines parallel to the pipe's axis? Laminar Flow

452. When a cement slurry is placed across a permeable formation under pressure a filtration process occurs. The aqueous phase of the slurry escapes into the formation leaving behind cement particles. This process is commonly known as what? Fluid Loss
453. What is a slang term referring to the member of a seismograph crew who places the geophones - Jug Hustler
454. A process of molecular bridging of polymers with other chemical substances that alters viscosity and shear rates to enhance lifting of bit cuttings and increase drilling rates - Cross Linking
455. What does a fracture look like on a acoustic image log? (Sinus) curve
456. What is the propagation direction of a hydraulic fracture? Perpendicular to the direction of the minimum principle stress
457. A condition in which the weight on a bit tooth has been so great that the tooth has dulled until its softer inner portion caves over the harder case area - Bradding
458. When a SP log deflects to the right of the shale base line, what is the most possible fluid in the formation? Fresh water
459. What is a small diameter channel worn into the side of a larger diameter of wellbore - Keyseat
460. The Society of Petroleum Engineers Board of Directors is made up of representatives from each of its geographic regions. How many regional directors does the SPE Board of Directors include? 15
461. Past Secretary of the Interior Albert Fall was found guilty for the Teapot Dome scandal 1929. Name two fields that were part of this scandal - Teapot Dome and Elk Hills
462. After natural depletion, the first step to improving oil recovery is pressure maintenance by injectng fluids into the reservoir. What is the most common secondary oil recovery method? Waterflooding
463. What are the three categories of enhanced oil recovery? Chemical Flooding, Gas Injection and Thermal Recovery
464. What oil field was said to have "oil fountains"? Baku Russia
465. How many wells were eventually drilled on the Big Hill? 214
466. What was the original term for a driller before Spindletop? Well Borer
467. Where was the term roughneck coined? Spindletop
468. What field in Oklahoma caused Oklahoma to be a larger producer of oil in the United States until 1928? Glenn pool
469. Who bought a thousand barrel a day well located in a church cemetery? William C Mellon
470. This excerpt, "Let our position be absolutely clear. An attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America, and such an assault will be repelled by any means necessary, including military force." Was part of what document? The Carter Doctrine
471. What British document warned off Russia and Germany from the Persian Gulf in 1903? Lansdowne Declaration

472. In 1977 who earned great respect in the oil world by turning the Shah from a price hawk to a compliant dove?
473. Jimmy Carter
474. What organization opposed Western imperialism and called for the renaissance or resurrection of the Arab World and its unity in one united states? The Ba'th Party
475. In 1956 who was recruited into the Ba'th Party? Saddam Hussein
476. Saddam Hussein assumed the Presidency of what party in 1979? The Ba'th Party
477. What company began working on the Colony Shale Oil Project in 1980 and ended in 1982 because of a lack of funds? Exxon
478. What was the name given to the development of the shale oil located in the Western slope of the Rocky Mountains? The Colony Shale Oil Project
479. In 1983 what underground structure off of Alaska was believed to be the next Prudhoe Bay or equivalent to the Saudi Arabian fields? Mukluk
480. What President of the United States came out of the oil and gas industry? George H. W. Bush
481. What is the oil capital of West Texas? Midland, Texas
482. In what year did the first dedicated gas station open? 1907
483. In what city did the first dedicated gas station appear? St. Louis
484. What is hot oil? Crude that is smuggled in order to elude quotas.
485. In 1947 the first major strike in Iran occurred when Abadan refinery workers protested what? Inhuman Living Conditions
486. During "The Golden Age of Oil" oil's success substituted what energy source? Coal
487. What company holds the world's all-time record of profits for an industrial company?
488. ExxonMobil
489. What year did ExxonMobil reach an all-time net profit of \$36.1 billion, setting a world's all-time record for an industrial company?
490. 2005
491. Which company built the last new refinery in the United States in 1976?
492. Marathon Petroleum
493. Which of the following refinery processes is considered semi-batch (opposed to continuous)?
494. Delayed coking
495. The feed to a catalytic reforming unit is always hydrotreated. Why is this?
496. Hydrotreaters remove sulphur, a Reformer catalyst poison
497. Petroleum refineries have many processes designed to minimize pollution to water and air. Name three processes which are designed primarily as environmental controls - Sulphur plant, Hydrotreater, Biotreater
498. Where was the last refinery built in 1976 - Garyville, Louisiana
499. What is the term used to describe Calories per gram of BTU per pound produced by burning fuels? Thermal value

500. What is the largest onshore oil field in China? Daqing Field
501. Approximately how many barrels were contained by the Daqing Field when it was discovered? 16 billion barrels
502. In what year was the Daqing Field discovered? 1959
503. Rank the seven SPE regions from highest to lowest professional membership - North America, Europe, Middle East, Asia-Pacific, Africa, Latin America & Caribbean, Russia & Caspian
504. What percentage of SPE membership is made up of Young Professional members? 28%
505. What 14 countries are currently members of OPEC? Saudi Arabia, Iran, Iraq, Kuwait, UAE, Qatar, Libya, Nigeria, Algeria, Equatorial Guinea, Gabon, Angola, Venezuela and Ecuador
506. How many national oil companies are operating in Brazil? 4 (National Petroleum Agency, Oil MS Brazil, Petroleo Brasileiro SA, and Repsol)
507. In what year was oil first discovered in Nigeria? 1956
508. This is an immense deposit of natural gas tied up in clathrate structures with water - Gas Hydrate
509. This term means keeping an oil and gas lease in effect by producing a well on that lease - Held by Production
510. Rank these ten countries by proven oil reserves from most to least
 - a. Venezuela, Saudi Arabia, Canada, Iran, Iraq, Kuwait, Venezuela, UAE, Russia, Libya, Nigeria.
511. This is a field that is at the edge of viability - Marginal Field
512. It is a common practice to use enough heavy walled drill collars in the lower section of the drill string so that the desired weight may be applied without any buckling problem, what is the name for the point above which there is no tendency to buckle? Neutral Point
513. Calculate the static mud density required in Lb/Gallon (ppg) to prevent flow from a permeable formation at 12200 ft if the pore pressure of the formation fluid is 8247 psig-
 $\text{Density(ppg)} = \frac{\text{pore pressure(psig)}}{0.052 \text{depth(ft)}} = \frac{8247}{0.052 \times 12200} = 13 \text{ lb/gal}$
514. Name the drilling distillation unit that is used to measure the the water, oil and solids content of a mud. It consists of a cylindrical body fitted with a mud sample holder, a heater element (or an oven) and an aluminium condenser - Retort, or mud retort
515. A mud sample in a rotational viscometer equipped with a standard torsion spring gives a dial reading of 46 when operated at 600 rpm , compute the apparent viscosity of the mud at this rotor speed - $\text{Apparent viscosity} = \frac{300 \text{dial reading}}{600} = \frac{300 \times 46}{600} = 23 \text{ cp}$
516. After each casing string is cemented in place, what pressure test is used to verify that the casing, cement and formations below the casing seat can withstand the wellbore pressure required to drill safely to the next depth at which casing will be set? Leak Off test
517. The most common commercial clay mined for use in drilling fluid is Wyoming bentonite, what is this clay primarily made of? Sodium montmorillonite

518. This type of tool uses either hydraulic or mechanical means to free pipe which is stuck in the well. What is the name of this type of tool? Jar
519. What is the main mud additive that is used to increase mud density to help prevent influx? Barite
520. Catching and analysing the mud and the cuttings that come to the surface can tell a great deal about what's going on down hole as the bit drills. What is the name for this analysis? Mud logging
521. What does the abbreviation SCSSV stand for? Surface-Controlled Subsurface Safety Valve
522. Name six functions of drilling mud - Clean bit, cool bit, transport cuttings, transmit mud pulses, lubricate bit, and prevent influx.
523. Name five types of offshore drilling rigs - Jack-up, submersible, semi-submersible, drill ship, platform.
524. What type of instrument is commonly used to determine mud viscosity in a lab? Rotational viscometer
525. What causes most drilling muds to have viscosity that varies in relation to shear rate? Non-Newtonian fluid
526. One type of bit that is used to drill through hard rock is the PDC bit, what does PDC stand for? Polycrystalline Diamond Compact
527. Who invented the roller-cone drilling bit? Howard Hughes
528. In what year did Howard Hughes receive a patent for his two cone roller-cone bit? 1909
529. What are the two types of tri-cone roller-cone bits? Milled tooth and carbide insert
530. This funnel-shaped device is used to transfer products especially related to drilling mud and cementing. What is the name of this device? Hopper
531. This method of perforation uses high pressure fluid slurry directed through nozzles to cut through casing and cement and extend a cavity into the reservoir. What is the name of this kind of perforation? Abrasive Jet Perforation or Sand Jet Perforation
532. What is the term for the type of drilling in which the drill bit rotates and cuts into rock - Rotary Drilling
533. What does BHA stand for? Bottom Hole Assembly
534. What is a hole shot in casing or liner to allow oil and/or gas to flow into the well? Perforation
535. In 2010, Chevron Canada drilled an offshore well that set the record for the deepest water ever drilled in Canada. What is the name and water depth of this well? Lona 0-55, 2600m
536. What well log is used to determine the wellbore radius and may also be used to determine the location of permeable formations along the wellbore? Caliper log
537. What does the abbreviation PBTD stand for? Plugged Back Total Depth

- 538.** Completions are divided into two specific parts, what are they? Reservoir (or lower) completion and Upper completion
- 539.** What is the term used to describe the determination of the production related pressure drop from the reservoir to the rock face of the reservoir completion? Inflow Performance
- 540.** What does TTRD Stand for? Through Tubing Rotary Drilling
- 541.** What is the term used to describe the pressure that is required at the rock face to open a fracture? Fracture initiation Pressure
- 542.** What are the subsurface devices designed to prevent an uncontrolled release of hydrocarbons from the well if something catastrophic occurs at surface? Subsurface safety valves
- 543.** Which devices provide both a structural purpose (anchor the tubing to casing) and a sealing purpose? Packers
- 544.** What tool is a permanent attachment to the side of the completion that allows the connection of valves and gauges? Mandrels
- 545.** What is the name for pup joints that have the same internal diameter as the tubing but have a larger outside diameter and are used to mitigate turbulence and erosion? Flow couplings
- 546.** What does HPHT completions stand for? High Pressure High Temperature completions
- 547.** What is the process of adding energy to the flow stream within the completion to increase the flow rate? Artificial Lift
- 548.** This is the term for a well that is drilled in an area where no current oil or gas production exists? Wildcat, or Rank Wildcat
- 549.** This is a short section of casing or tubing used as a depth identifier to a collar locator log or used at the top of the well when spacing out a string prior to hanging the string - Pup joint
- 550.** What is a Heave Compensator used for on an offshore rig - It keeps the proper amount of tension on the drill string allowing it to remain unaffected by wind and waves.
- 551.** What does IADC stand for? International Association of Drilling Contractors.
- 552.** What organization supplies standard contract forms that can be modified for a specific project by the oil company and the drilling contractor's legal department? IADC
- 553.** What type of contract specifies that an operator will be responsible for all activities and costs while drilling and is paid according to the daily cost of the rig? Daywork contract
- 554.** Which contract requires that the contractor be responsible for the costs and activities associated with the rig and the operator responsible for other items such as drilling fluid, site preparation, and well casing? Footage or meterage Contract
- 555.** Under which contract is the contractor paid by the number of feet or meters drilled? Footage or metreage Contract
- 556.** What contract says that the drilling contractor is responsible for the entire drilling operation and is paid a specified fee when the job is complete? Turnkey contract

557. Which type of drilling contract is most common? Daywork contract
558. What type of rig was first used in the United States for oil well drilling? Cable-tool rig
559. What was the traditional method of powering a cable-tool rig? Steam-powered engine
560. What are the two parts of the annulus? The inside annulus and outside annulus.
561. What is the spacious difference between the well casing and drill stem called? The annulus
562. These wells are often drilled after a discovery and are used to determine the size of the hydrocarbon deposit - Appraisal Well
563. What is the chemical process of changing clay or other minerals to make them meet specific performance levels? Beneficiation
564. What type of fluid has a linear shear stress? Bingham Plastic
565. Name three types of Blow out Presenters? annular blowout preventers, single ram blowout preventers, and double ram blowout preventers, shear ram, blind ram, blind shear ram.
566. What is the term for the line that goes straight through from the flow line of the wellhead to a flare pit. It is often used in diverting flow during a well control incident - Blooie Line
567. This is the part of the drilling rig that rises above the substructure and houses the crown block and draw works - Derrick
568. This type of well there is an inclination other than zero degrees from vertical - Deviated Well
569. This type of well does not have or produce any commercial deposits of hydrocarbons - Dry Hole
570. Which type of plot tests injectivity and is useful for establishing formation behaviour during pumping? Hall Plot
571. This is the mud weight that is actually felt by the formation when fluid is being pumped - Equivalent Circulating Density (ECD)
572. This device is ran on the inside of tubular goods to ensure that the pipe has the proper drift - Rabbit
573. What is the informal term for the type of drilling rig that is fitted with long support legs which can be raised or lowered independently of each other? Jack up rig
574. In Horizontal well drilling, what does KOP stand for? Kick off Point
575. What device is a metal wedge that is inserted in the hole to deviate the drill bit in hard rock situations? Whipstock
576. This rig has a folding mast that can be lowered and raised quickly - Jack Knife Rig
577. This is another word for geophone - Jug
578. What type of join is a flex join in a tool string that allows alignment with a target not in the same plane? Knuckle Joint
579. This is a lump of non-dispersed polymer - Microgel (also called fisheyes)

580. Name three deflection methods for deviated wells - Whipstock, bent sub, jet bit
581. What is a well called that is close to, but outside of the known reservoir? stepout well
582. What is the name of the enlargements and elongation of a borehole in a preferential direction which are formed by spalling of fragments of the wellbore in a direction parallel to the minimum (least) horizontal stress (S_h)? Borehole Breakout
583. What two well logs can be combined to identify a breakout? Caliper logs and Image logs
584. What is a small-diameter channel worn into the side of a larger diameter wellbore? Keyseat
585. Name the sources of horizontal stresses - Poisson's Ratio Effect and Tectonic Stresses
586. What type of gravel pack is limited to single zone completions - Under reamed-casing gravel pack
587. For inside casing gravel packing, which method is the gravel placed opposite the productive interval before the interval before the screen is placed, and then the screen is washed to its final position? Wash-down method
588. When using the crossover method of inside casing gravel packing, what signals the squeezing stage? When the telltale screen is covered and the pressure increases.
589. What happens during the squeezing stage in the crossover method of inside casing gravel packing? During squeezing the carrier fluid leaks off to the formation, placing gravel in the perforation tunnels.
590. A dune will form in the casing screen annulus when gravel packing what type of well? Deviated well.
591. What does Schwartz(1969) correlation for optimal gravel size based on the formation grain size distribution depend on? Uniformity of the formation, and velocity through the screen.
592. What type of logs can be used to locate the top of the gravel packed section and to detect voids in gravel packs? Unfocused gamma ray logs
593. Skin factor is a numerical value used to analytically model the difference from the pressure drop predicted by Darcy's law due to skin. What is the typical range of this factor in petroleum glossary? -6 - 100
594. Oil recovery operations traditionally have been subdivided into three stages . What are the three stages? Primary, secondary, and tertiary recovery
595. What API instrument is used to measure liquid specific gravity? What is the equation to determine API gravity from specific gravity? Hydrometer, $API = (141.5/\gamma) - 131.5$
596. This is defined as the ratio of the density of a gas to the density of dry air when both are measured at the same temperature and pressure - Specific Gravity
597. The constant b in van der Waals equation of state is a correction for what? Volume occupied by the molecules of the gas
598. This is the fractional change of volume as pressure is changed at constant temperature for a gas - Coefficient of isothermal compressibility
599. What is the oilfield unit for dynamic viscosity? Centipoise

- 600.** What is the reciprocal of viscosity? Fluidity
- 601.** This type of oil contains fewer heavy molecules and more intermediates than black oils - Volatile oil
- 602.** This type of diagram (formed from equilateral triangles) is used for three-component mixtures and must be plotted in such a way that the compositions of all three components can be displayed - Ternary diagram
- 603.** This point is the upper limit of the vapour-pressure line - Critical Point
- 604.** When a gas or liquid flows across a sand face, through a choke, or any device that introduces a pressure drop, the temperature will decrease. What causes this? Joule-Thomson Effect
- 605.** This term is a dimensionless factor calculated to determine the production efficiency of a well. Positive values indicate damage which impairs productivity while negative values indicate enhanced productivity. What is the name of this term? Skin
- 606.** What does EOR stand for? Enhanced Oil Recovery
- 607.** Name one of the three main methods of EOR - Gas injection, chemical injection, or thermal recovery.
- 608.** Which EOR method uses gases that expand in a reservoir and push additional oil to a production well bore? Gas injection
- 609.** What gasses are commonly used in gas injection? Carbon dioxide, natural gas, or nitrogen.
- 610.** What Method of EOR uses heat? Thermal Recovery
- 611.** Which method of EOR uses polymers or detergent-like surfactants to help lower the surface tension that often prevents oil droplets from moving through a reservoir? Chemical injection
- 612.** First tried in 1972 in Scurry County, Texas, what method of EOR has been used successfully throughout the Permian Basin of West Texas and New Mexico? CO₂ Injection
- 613.** How much more of a reservoir's in place oil can EOR techniques potentially produce? 30% - 60%
- 614.** This is the theoretical flow rate a well could deliver with zero pressure at the middle of the perforations. Often abbreviated AOF, what is the name of this flow rate? Absolute Open Flow Potential
- 615.** What is described as a cylinder of rubberlike material which is run on a tubular string down hole and is compressed to expand and seal the well at that level? Packer
- 616.** What is the term used to describe the lowest temperature at which an oil will pour or flow under certain prescribed conditions? Pour Point
- 617.** What is the best course of action when producing a gas condensate field? Maintain the reservoir pressure about dew point in order to prevent liquid dropout in the reservoir
- 618.** What are two reasons that it is beneficial to keep gas dissolved in oil while in the reservoir? Gas lowers the viscosity of oil and increases the mobility of the oil
- 619.** What are three ways to prevent coning effects? Don't produce at too high of a rate, don't complete the well near the OWC or GOC, use horizontal drilling

620. What instrument is used to determine liquid specific gravity? Hydrometer
621. This refers to a variety of processes to increase the amount of oil removed from a reservoir, typically by injecting a liquid or gas - Enhanced Oil Recovery (EOR)
622. This is the term for operations on a producing well to restore or increase production. May be performed to stimulate the well, remove sand or wax from the wellbore, to mechanically repair the well, or for other reasons - Workover
623. What is the term for the forming of larger droplets from smaller droplets? Agglomeration
624. What field supplied 51% of the world's oil in 1901? Baku, Russia
625. In 1859, what town in Pennsylvania did Edwin Drake strike a gusher which triggered the world's first oil rush? Titusville, Penn, USA
626. Which location lost more oil in one day before it was capped than was being extracted worldwide in September of 1886? Bibi-Heybat
627. In the early 1900s and late 1800s which location became the largest oil producer in the world? Caspian Sea area
628. Where did the Nobel Brother's Petroleum Company start? Baku, Russia
629. Who designed the first oil tanker, Zoroaster? Ludwig Nobel
630. How was Nobel oil able to reach East Asia's oil market quicker and cheaper than Rockefeller's Standard Oil? Suez Canal
631. Who joined with Nobel to help transport oil across land? Rothschild
632. Who was the leading competitor of Rockefeller in the early 1900s? Nobel Brothers
633. Who became the largest single private shareholder of Royal Dutch in 1913? Rothschild
634. This Voluntary Agreement was designed to manage the loss of Iranian oil supplies which would have allowed each country to cooperate with one another if the Suez Canal was closed. In what year was the voluntary Agreement signed?
635. 1950
636. Which United States President said these words. "We should not be acquiescent in any measure... which would give the Bear's claw a grip on production or transportation of oil which is so vital to the defence and economy of the Western World." - Dwight D Eisenhower
637. Who said these words? "Without petroleum all the machines and tools of the industrial world are mere pieces of iron, rusty, motionless and lifeless." - Gamal Abdel Nassar (leader of Egypt)
638. Gamal Abdel Nassar (leader of Egypt) ordered which companies pipeline to be sabotaged during the Suez Canal conflict? The Iraq Petroleum Company

639. What was the operation between the United States and Europe that helped the western European countries during the oil shortage when the Suez Canal was closed - The Oil Lift
640. In 1956 what percentage of Europe's total energy consumption came from oil? 20%
641. What was the conference held in March of 1957 to declare a formal process of healing between Eisenhower and Macmillan? Bermuda Conference
642. In the oil industry, what is the term used to describe a giant oil field? An Elephant
643. In the year 1972 how many barrels of oil were produced worldwide? 42 million
644. What was the name given by Enrico Mattei to a group of companies comprised of Jersey(Exxon), Socony-Vacuum(Mobil), Standard of California (Chevron), Texaco, Gulf Royal Dutch/Shell and British Petroleum? "Sette Sorrelle" or "Seven Sisters"
645. What was the nickname given to Columbus Joiner during the discovery of the East Texas Field? 'Dad' Joiner
646. What 1920s oil promoter made \$2 million in one year before being apprehended by US Federal Authorities? Dr. Frederick Cook
647. What is the name of the well that discovered the East Texas Field? Daisy Bradford #3
648. Who, in November of 1930, bought all of the rights to the East Texas Field from Dad Joiner, settled the claims against Joiner, and became the largest independent in East Texas? Haroldson Lafayette Hunt
649. The term 'hot oil' was first coined in 1933 in relation to what field? East Texas
650. What USA Secretary of the Interior rescued the American oil industry from the brink of collapse in 1933? Harold Ickes
651. What two men are considered responsible for the discovery of the East Texas Field? Dad Joiner and Doc Lloyd
652. The National Industrial Recovery Act helped to save the American oil industry by allowing some governmental control over production. In what year was this Act passed? 1933
653. An agreement was created in 1935 between several oil producing states to allow for an exchange of information and standardization of legislation between these states. What is the name of this agreement? Interstate Oil Compact
654. In what year did the first ever USA tariff on imported oil appear? 1932
655. What company was, in the late 1800s, commonly referred to as the "Old House"? Standard Oil
656. What is the name of the only company that was a major producer, other than Standard Oil, of California oil fields, in the 1890's? Union Oil
657. Who was the man who originally discovered the oil field in Beaumont, TX known as Spindletop? Patillo Higgins
658. In what year did Marcus Samuel of Shell Transport and James Guffey sign their twenty year contract at Spindletop? June 1901
659. What company did Joseph "Buckskin Joe" Cullinan create in Beaumont in 1901? The Texas Fuel Company

660. What was the name of the man who drilled the first well for Patillo Higgins on top of Spindletop in 1893? Walter B. Sharp
661. In what year did John D. Rockefeller retire from Standard Oil? 1897
662. Who did John D. Rockefeller put in charge of the company after his retirement? John Archbold
663. What were the writers of the progressive agenda, around the turn of the 20th century known as? Muckrakers
664. When was the Standard Oil Trust established? 1882
665. This man took his first geology course to avoid Latin and then took time off from school to visit Mexico where he would discover the Portrero del Llano 4 well in the Golden Lane - Everette Lee DeGolyer
666. This was the first independent oil company founded by Everette Lee Degolyer - Amerada
667. During World War II this man was called to be one of the chief deputies to Harold Ickes in the Petroleum Administration for War. In 1943 he was given a special mission to appraise the oil potential of Saudi Arabia - Everette Lee DeGolyer
668. What does CASOC stand for? California-Arabian Standard Oil Company
669. What were the two parent companies of CASOC? Standard of California and Texaco
670. This man was king of Saudi Arabia during World War II. Ibn Saud
671. This policy is known as the direct involvement by the American Government in Saudi Arabia - Solidification
672. This government entity, founded during World War II, was created with the aim of acquiring actual ownership of foreign oil reserves - Petroleum Reserves Corporation
673. When was the Anglo-American Petroleum Agreement signed? August 8, 1944
674. In what year did American imports of oil first exceed American exports? 1948
675. In what year did Calouste Gulbenkian die? 1955
676. In 1948 oil and oil imports were 20% of the budget for this massive plan to help rebuild Europe - Marshall Plan
677. What was the name of the pipeline that would carry Saudi Arabian oil to the Mediterranean? Tapline
678. When was the oil pipeline, Tapline, which would carry oil from Saudi Arabia to the Mediterranean completed? September 1950
679. How long was Tapline? 1040 miles
680. What was the first company to build a platform in the Gulf of Mexico? Kerr-McGee
681. In what year did Kerr-McGee strike oil in the Gulf of Mexico? 1947
682. IN 1947 these two quickly built wartime oil pipelines that brought oil from the southwest to the northwest United States were converted to gas pipelines - Big Inch and Little Inch
683. What does the abbreviation OPEC stand for? Organization of Petroleum Exporting Countries
684. Who was the Canadian scientist who first patented Kerosene in 1854? Abraham Gesner

685. In what year did Edwin Drake drill the first successful well in Pennsylvania? 1859
686. What company was the predecessor of Total, Chevron, and ExxonMobil? Standard Oil
687. What country today holds more than 20% of the world's known reserves? Saudi Arabia
688. When was the first Oil & Gas Journal published? 1902
689. To date, what percent of oil discoveries have occurred in anticline formations? 70%
690. Who pioneered "seismic prospecting", using seismic tools to determine the presence of oil or gas? Everett DeGolyer
691. William Burton introduced what oil refining process in 1909? Thermal cracking
692. Just before WWI what country provided 60% of the world's oil? USA
693. What year was the Ghawar field discovered? 1948
694. The first tanker through the Suez Canal after it reopened carried oil for which individual? J. Paul Getty
695. In what year did Eisenhower decide to put quotas on foreign oil? 1959
696. In what year did British Petroleum make its first reduction to its oil prices? 1959
697. This is a cyclic compound associated with asphaltenes that helps keep asphaltene platelets in suspension - Maltene
698. This is a comparison of the ability of a fluid to move through another fluid or to displace the fluid - Mobility Ratio
699. This type of flow occurs at an early time during testing of wells that are hydraulically fractured with a finite-conductivity fracture - Bilinear flow
700. This type of flow occurs from the formation to the wellbore is channeled through a short set of perforations or through the small probe of a wireline formation tester. The typical slope of this type of flow is t to the $-.5$? Spherical Flow
701. During which type of flow can permeability, average pressure, and wellbore skin be calculated? Radial Flow
702. What type of flow happens when all the boundaries have been encountered in a closed reservoir and the formation is undergoing depletion? Pseudosteady-State Flow
703. What are the five types of reservoir boundaries? No-flow, constant-pressure, leaky, conductive, composite limits.
704. This type of well uses the principle of superposition in space to solve linear boundary problems by superposing individual mirrored infinite solutions - Image Wells
705. What is the ratio between fluid inertial forces and fluid gravitational forces? Froude Number
706. Oil samples from the reservoir can be collected in two ways. What are these two ways? Bottom hole sample and separator sample
707. This type of plot estimates water saturation and can also help determine formation water resistivity, cementation factor and the matrix parameters for sonic and density logs? Pickett Plot
708. Which law states that all pure gases have the same z factor at the same values of reduced pressure and reduced temperature? Law of Corresponding States

- 709.** What is a naturally occurring mixture of short chain hydrocarbons with a minor amount of inorganic compounds? Natural Gas
- 710.** What is the principle component of Natural Gas? Methane
- 711.** What are the three main types of conventional gas? Associated gas, non-associated gas, gas condensate
- 712.** What are the three types of natural gas reservoirs? Gas condensate (retrograde condensate), wet gas, dry gas.
- 713.** What type of gas has a high content of liquid hydrocarbon at pressures and temperatures lower than reservoir conditions? Gas condensate
- 714.** What gas is dissolved in oil under natural conditions in an oil reservoir? Associated gas
- 715.** What type of gas is from reservoirs with little oil? Non-associated gas
- 716.** Name two types of unconventional natural gas - Tight sand gas, tight shale gas, coal-bed methane, geo-pressurised gas reservoirs, gas hydrates.
- What type of gas is adsorbed onto coal surfaces? Coal Bed methane
- 717.** Which log distinguishes permeable zones from non-permeable zones and is measured in mV? SP logs
- 718.** Name a log that does not work in oil based mud? Any normal electric log.
- 719.** Which log is the most commonly used measurement? Gamma Ray log
- 720.** Shale has approximately what API? 100
- 721.** What are estimated volumes of oil and gas that are thought to be economically recoverable? Reserves
- 722.** This type of reserve can be estimated with reasonable certainty that it can be recoverable under current economic conditions - Proved Reserves
- 723.** What type of reserve has about a 90% probability of estimates meeting cited value? Proved Reserves
- 724.** What type of reserves can be recovered from new wells, deepening wells, or when a large expenditure is required to obtain production? Undeveloped Reserves
- 725.** what reserves have a 50% probability of producing? Probable Reserves
- 726.** What is the difference in pressure between two phases in equilibrium at the same depth called? Capillary Pressure
- 727.** This graph can be used to indicate whether a formation is homogenous or heterogeneous? Capillary Pressure vs Water Saturation.
- 728.** Why does oil viscosity decrease with decreasing pressure above bubble point?
- 729.** The oil molecules are not forced as close together as they are at higher pressures.
- 730.** Relative permeability is controlled by what factors? Pore Geometry, Wettability, Fluid Distribution, and Saturations/Saturation History.
- 731.** What is the reduction in an ability of a fluid to flow in the presence of two or more immiscible fluids called? Relative Permeability Effect.
- 732.** When does hysteresis occur? When there is a reversal in the direction of saturation.

- 733.** What could cause flow reversals in a reservoir which might lead to hysteresis?
Changing a flood pattern, changing injection rates, or shutting in a well.
- 734.** On a gas-oil relative permeability curve at what point will gas relative permeability begin to increase above 0? Critical Gas Saturation.
- 735.** What is another name for initial reservoir pressure, the pressure of a reservoir before it is produced? Discovery pressure (also virgin pressure)
- 736.** What are oil samples called that are obtaining by shutting the well is and sampling the oil at the bottom of the wellbore? Bottom-Hole Sample or Subsurface Sample.
- 737.** What are oil samples called that are obtained by carefully controlling production rate and sampling separator gas and separator liquid? Separator samples or surface samples.
- 738.** In what flow regime is pressure constant with time everywhere in the reservoir?
Steady state
- 739.** Why is the calculation of the production rate of a well with an irregular drainage pattern only valid at early times? Either Drainage patterns will change, if they are artificially induced, or the average reservoir pressure will not decline uniformly within the drainage areas because of different production rates and resulting different rates of depletion
- 740.** When constructing IPR curves what are the axis? y axis is bottom hole pressure p_{wf} , and x axis is flow rate
- 741.** What direction should a horizontal well that is not intended to be hydraulically fractured be drilled? Along the direction of minimum horizontal stress.
- 742.** When the oil saturation becomes the residual oil saturation, what is the value of the effective oil permeability (k_o)? Zero
- 743.** What does the diffusivity equation describe? The pressure profile in an infinite-acting, radial reservoir, with a slightly compressible and constant viscosity fluid.
- 744.** In terms of ultimate recovery which expansion would prove to be more efficient, free or solution gas or oil? Free or solution gas
- 745.** Oil viscosity can be estimated using which correlations? Beggs and Robingson (1975) and Vasquez and Beggs (1980)
- 746.** How is the Relative permeability of gas calculated? $K_{rg}=k_e/k$
- 747.** When using Vogels correlation to calculate an IPR for a two phase reservoir, at what pressure should the viscosity and formation volume factor be taken at - Average reservoir pressure, p_{bar} .
- 748.** Gas flow in a reservoir under transient conditions can be approximated using which two equations? Darcy's law (rate equation) and the continuity equation.
- 749.** Define Positive skin? Any phenomenon that causes a distortion to the flow lines from the perfectly normal to the well direction or a restriction to flow.
- 750.** What are five causes of positive skin? Mechanical causes such as partial completion, inadequate number of perforations, phase changes(relative permeability reduction to the main fluid), turbulence, and damage to the natural reservoir permeability

751. What effect does a negative skin have on the effective well bore radius? Increases effective well bore radius.
752. How does the "huff and puff" operation combat the skin effect in a gas condensate reservoir? The injection of neat natural gas re-dissolves the condensate and displaces it into the reservoir.
753. A well is sometimes deliberately completed in order to retard or avoid what effect? Coning effects
754. What effect does increasing the angle of slant of a well have on skin? The larger the angle of slant the larger the negative contribution to the total skin effect.
755. What is an underbalanced reservoir? Pressure in the well is less than the pressure in the reservoir.
756. When drilling a horizontal well, what shape would production-induced damage cause? Elliptical
757. A sudden decrease in salinity of the brine flowing through a sandstone will cause formation damage by dispersing clay particles, what is this phenomenon know as? Water sensitivity
758. What are the most common organic species that cause formation damage? Waxes(Paraffins) and asphaltenes
759. Under what circumstances will fluids cause damage to the formation? Change in apparent viscosity of the oil phase or a change in relative permeability

760. What is the most common source of formation damage? Drilling.
761. What is the angle between a planar feature, such as a sedimentary bed or a fault , and a horizontal plane? Dip
762. What mineral is the major constituent of sandstone and other clastic sedimentary rocks? Quartz
763. What is the name for a type of subsurface map having contours that display the elevation of a particular rock layer such that folds and faults are clearly displayed? Structure map
764. What mineral is the main component of limestone? Calcite
765. What two rock types are the most common reservoir rocks? Sandstone and Carbonates
766. What is defined as the zone in the earth where crude oil is generated from organic matter in source rocks? Oil window
767. What type of unconformity is formed where the beds beneath the erosional surface are tilted and eroded? Angular Unconformity
768. In sedimentary Geology what does BIF stand for? Banded Iron Formation
769. What is a map that shows areal variations in facies of a given stratigraphic unit? Facies map
770. What rock type is made of broken fragments that are cemented together? Clastic rocks
771. This is defined as the ability of a rock to transmit fluid through pore spaces? Permeability
772. This is the estimation of the age of a formation? Absolute ages

- 773.** This is another term for the ocean floor? The abyssal plain
- 774.** This type of secondary fault is set with opposite direction with respect to the primary fault - Anithic or antithetic fault
- 775.** This is a sandstone containing 25% or more of feldspars, usually derived from silicic igneous rocks - Arkose
- 776.** What is an irregular intrusion of an igneous rock into another rock? Batholith
- 777.** What is the breakdown of heavier oil to a lighter hydrocarbon by bacterial action? Biodegration
- 778.** In the oil industry what does OCS stand for? Outer Continental Shelf
- 779.** This hard, silicate sedimentary rock is similar to flint but with a less ordered structure. It is a cryptocrystalline form of quartz and is known to be extremely hard on drill bits? Chert
- 780.** This term is the process of forming a sedimentary rock from the clastic grains. May also be in conjunction with several geochemical processes such as cementation reactions and chemical dissolution - Diagenesis
- 781.** This term means the different parts of a rock strata indicating a change in mineral content or deposition mechanics - Facies
- 782.** This is a silicate mineral, often modified and sometimes part of the movable particles in a formation. Its most common form is potassium - Feldspar
- 783.** This type of map shows contour points of equal formation thickness. It may also show depth of the zone - Isopach Map
- 784.** What is the name for the lowest point of closure on a structural trap which defines the maximum possible size of the trap? Spill Point
- 785.** What is the vertical component of a fault's displacement? Throw
- 786.** What is the horizontal displacement of a fault and is shown on a map as the width of the fault? Heave
- 787.** What type of fault is formed when the hanging wall rotates, the fault plane itself is curved and the dip of the fault decreases with depth? Listric Normal Fault
- 788.** What are the three stages of a salt dome? Pillow stage, True piercement stage, Postdiapiric stage
- 789.** What type of reserves can be estimated with reasonable certainty to be recoverable under current economic and technologic conditions? Proved Reserves
- 790.** What is the most common method to calculate a rock volume from an isopach map? Trapezoidal Rule
- 791.** This type of log measures the natural battery effect that occurs at the interface where foreign ions from the drilling mud have entered into porous zones - Spontaneous Potential (SP)
- 792.** Which type of log induces a current in the formation through the use of transmitter coils and induced magnetic fields in the formation? Induction log

793. When did Gus Archie first publish his equation for calculation of water saturation?
1942
794. What is a measurement of the ability of a fluid to coat a rock of mineral surface?
Wettability
795. Name the four types of Aliphatics? Alkanes, Alkenes, Alkynes, and Cyclic Aliphatics
796. This type of Kerogen is composed of naphthenes, aromatics and aliphatics, commonly found in rocks deposited in marginal marine carbonates and shales. This kerogen is considered to be volumetrically the most important source rock for oil - Type II Kerogen
797. This type of reservoir is one in which the predominant producing mechanism is fluid expansion - Depletion Drive Reservoir
798. This oil Field is a Sadlerochit formation that was formed as a delta and braided stream sequences that is bounded by unconformities and was derived from a Permian and Triassic mountain range that existed north of this field? Prudhoe Bay Field
799. What is the process by which kerogen is converted, at elevated temperatures, into petroleum? Catagenesis

800. This type of unconformity is formed where sedimentary beds overlie an erosional surface carved into igneous or metamorphic rocks? Nonconformity
801. This is a highly chemically modified carbonate. They usually form cave structures - Karst
802. This is the initial stage of oil that never developed completely into crude and is typical of oil shales. There are three types of these - Kerogen
803. What is the process of changes that produce rock from sediments? Lithification
804. What is the ten-point scale of mineral hardness? It has diamond at 10 and talc at 1 - Mohs Scale of Hardness
805. What is a well logging device that is used to measure the angle between beds and the horizontal plane within a well? Dipmeter
806. A state of stress in which one principal stress is normal to the earth's surface, a typical situation found throughout a majority of basins in the continental crust - Andersonian State of Stress
807. What style of faulting may occur when the Vertical Stress is greater than the horizontal stresses? Normal faulting/ Extensional
808. What style of faulting may occur when the Horizontal Stress is greater than the vertical stress? Reverse/Thrust faulting
809. Who was the president of Standard oil in 1926 - Walter Teagle
810. In the 1970's "the Texaco Building" in Vienna became known as what? The OPEC building
811. What years were named OPEC's Golden Age according to a former Secretary General of OPEC? 1974-1978
812. Where was the Conference on Economic Cooperation held in 1977? Paris, France

813. This King was murdered by his nephew in March of 1975 - King Faisal of Saudi Arabia
814. In the 1970's these two countries represented roughly 48% of OPEC's total production - Iran and Saudi Arabia
815. What event effectively ended the 'As-Is' agreement in 1939? World War II
816. What Persian leader cancelled Anglo-Persian's concession in November of 1932 due to low royalties which he blamed on the company? Shah Reza Pahlavi
817. What man was responsible for restoring a concession for Anglo-Persian in Persia in 1933? John Cadman
818. After intense negotiating between the Mexican government and oil companies, what leader nationalized Mexico's oil in 1938? Lázaro Cárdenas
819. What is the process classed that involves large amounts of hydrogen being added to coal under high temperatures and pressures under the presence of a catalyst to create synthetic fuels? Hydrogenation
820. In 1940 what percentage of Germany's oil came from its own synthetic production? 46%
821. In 1943 how many barrels of synthetic fuel was produced in Germany? 124,000
822. In what year did synthetic fuels provide 57 percent of the total oil supply in Germany? 1944
823. During WWII what three companies provided 85 percent of Great Britain's oil Supply? Shell, Anglo-Iranian, and Jersey
824. In 1941 American had a surplus of oil that was how many barrels per day? 3.7 million barrels per day
825. Little Inch which was longer than Big Inch was how long? 1475 miles
826. By the end of 1944 what percentage of oil was being moved by pipeline in the United States? 42%
827. During WWII what did the acronym PAW stand for? Petroleum Administration for War
828. Between December 1941 and August 1945 how many barrels of oil did the United States and the allies consume? 7 billion barrels
829. What year was the first presidential speech on energy in the USA? 1973
830. Who gave the first presidential speech on energy in 1973? Nixon
831. What was the result of price controls on oil imposed by Nixon in 1971? lower oil production and higher consumption, causing gasoline shortages.
832. By 1973 which country became the "swing producer" for the whole world? Saudi Arabia
833. What was another name for the "Arab oil embargo" of 1973 which OPEC proclaimed in response to the USA decision to help the Israeli military? Oil Weapon
834. How long did the embargo that started October 1973 last? March 1974
835. What was implemented as a part of the Arab oil embargo? Cutbacks in oil production followed by 5% cutbacks each month
836. Which two countries did the Arab oil embargo initial ban all export of oil to? United States and the Netherlands

- 837.** What other countries did the Arab oil embargo eventual expand a ban of exports?
Portugal, South Africa, and Rhodesia
- 838.** What invention in 1879 deeply threatened the oil industry? Electricity
- 839.** What trust company was the first to challenge Standard Oil in the industry? Pure Oil Company
- 840.** Who was the professor that consulted on many of the first California oil promotions?
Dr. Benjamin Silliman Jr.
- 841.** What American oil company other than Standard Oil was able to maintain a continuous existence from 1890 to 1920? Union Oil (Unocal)
- 842.** What was the name of the first major oil well in Texas? Lucas 1
- 843.** Who was the first man to think that the 'Big Hill' would be profitable? Patillo Higgins
- 844.** In 1901, what company made a contract with James Guffey for 20 years? Shell Transport and Trading
- 845.** In what year did Texas reclaim its rank as the #1 oil producer in the United States?
1928
- 846.** In what year were the Guffey Petroleum and Gulf Refining companies founded? 1901
- 847.** In what year was the Glenn Pool in Oklahoma discovered? 1905
- 848.** Who was the first president of Gulf Oil Corporation? Andrew Mellon
- 849.** In what year was the Texas Fuel Company founded? 1901
- 850.** Who founded the Texas Fuel Company? Joseph 'Buckskin Joe' Culliman
- 851.** When did the Texas Fuel Company change its name and what was the name changed to? 1906, Texaco
- 852.** In what year was Standard Oil Trust dismembered into Standard Oil Interests? 1892
- 853.** What was the name of Rockefeller's 'Lady Friend' that worked at McClure's? Ida Tarbel
- 854.** In what year did the Federal Court order the dissolution of Standard Oil? 1909
- 855.** What act was passed that culminated in the dismemberment of Standard Oil? Sherman Anti-Trust Act
- 856.** What company did Standard Oil of New York become? Mobil, later ExxonMobil
- 857.** What company did Standard Oil (California) become? Chevron
- 858.** Standard Oil of Ohio is now what company? American arm of BP
- 859.** What company did Standard Oil of Indiana become? Amoco, later bought by BP
- 860.** From what company did Conoco emerge? Continental Oil
- 861.** In what year was the process of thermal cracking discovered? 1909
- 862.** Who was the owner of the Shell Transport and Trading Company in the late 19th and early 20th Century? Marcus Samuel

863. Who was the London representative of the Rothchilds' oil interests that was the middleman for the amalgamation negotiations between Shell and Royal Dutch? Fred Lane
864. In what year was British Dutch created? 1901
865. From what two companies did British Dutch emerge? Shell Transport and Royal Dutch Petroleum Company
866. In what year did British Dutch and the Rothchilds sign an alliance? June 1902
867. What was the mega-company created by the Rothchild/British merger named? Asiatic Petroleum Company
868. Who was the chairman of the Asiatic Petroleum Company? Marcus Samuel
869. Who was the Managing Director of the Asiatic Petroleum Company? Henri Deterding
870. In what year did Royal Dutch and Shell Transport unite to form the Royal Dutch Shell Group? 1907
871. Who was Henri Deterding's de facto commercial deputy? Robert Waley Cohen
872. What was the name of the first company that Mark Abrahams set up in the USA? Roxana Petroleum
873. What was the nickname of the Rothchilds' London representative Fred Lane? 'Shady' Lane
874. Who was the managing director of Anglo-Persian in 1916? Charles Greenway
875. During WWII, what major advantage did the Germans have at sea? Diesel driven submarines
876. In 1917, when the French established the Comite General du Petrole, who was put in charge? Senator Henry G. Berenger
877. Which Allied countries were involved with the Inter-Allied Petroleum Conference? USA, Britain, France, Italy
878. When did the Inter-Allied Petroleum Conference take place? 1918
879. In 1917, who was the president of Standard Oil of New Jersey and also was the chairman for the National Petroleum War Service Committee? Alfred Bedford
880. Who was the head of the Oil Division in the Fuel Administration for the USA in WWII? Mark Requa

TO GOD BE THE GLORY