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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2018

Program: M Tech: Petroleum Engineering

Subject (Course): Well Intervention and Well Stimulation techniques

Course Code : PEAU7008

No. of page/s: 3

Semester – II

Max. Marks : 100

Duration : 3 Hrs

Instructions: Use of books, handouts, calculators is allowed but Cellphone, Internet, is NOT ALLOWED.

Section-A

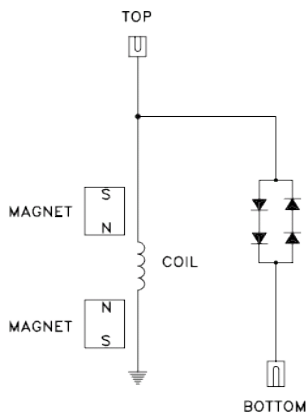
5X4=20

1. What is Dynamic Under-Balance Perforating Technique? When is it used? What special equipment is needed? What is the sequence of events? (4)
2. In Wireline Pressure Control Equipment, there are three different modules that can provide a seal around the Wire or Slickline, describe each of them briefly (4)
3. When we go from Open Hole Depth to Cased Hole Depth then which two forms the basis of all Depth Correlations? Describe each briefly (4)
4. In Pipe Inspection Logging, what are the differences between Corrosion, Erosion, and Wear? Give examples to explain (4)
5. In Sandstone Acidizing using HF/HCL, describe briefly, the sequence of events (4)

Section-B

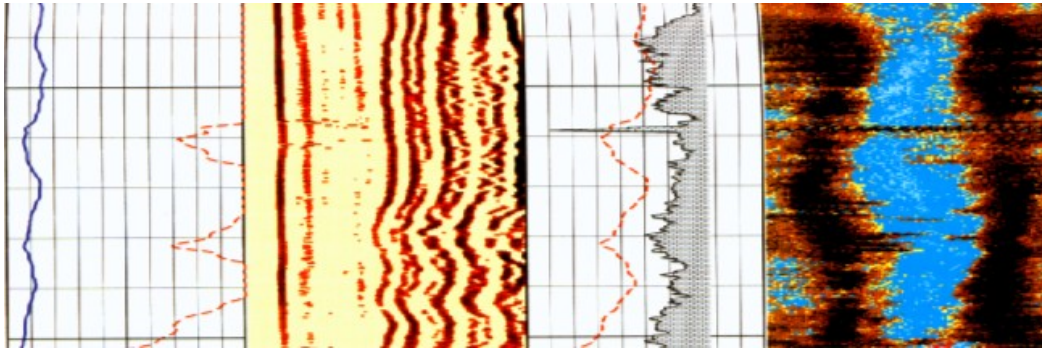
5X8=40

6. In a standard Casing Collar Locator Tool,

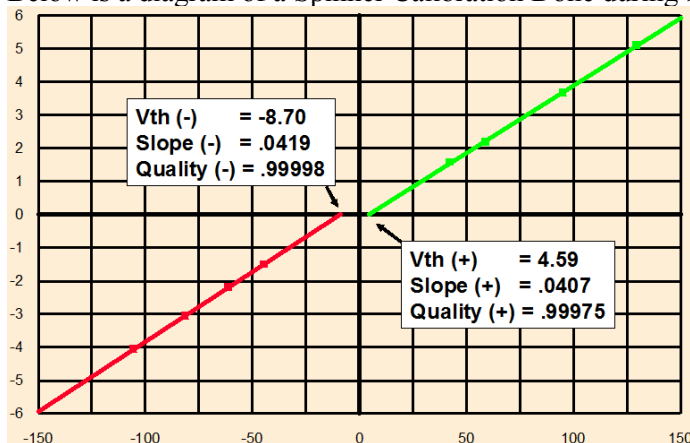


- a) Explain how the CCL works? (4)
- b) Why are the two magnets placed in an opposing configuration? (2)
- c) What is the purpose of the Anti-Parallel Diodes ? (2)

7. Below is a CBL Log run along with Ultrasonic Cement Evaluation Too. On the first Track is Amplitude Curve, Second track is VDL, Third Track is Average Z and on the Fourth Track is the Circumferential Image of Z.
- In a typical case of Channeling, what is the position of the channel? Why? (4)
 - What can you say about Casing Arrivals (2)
 - What can you say about Formation Arrivals (2)



8. Below is a diagram of a Spinner Calibration Done during Shut-In Period of the well

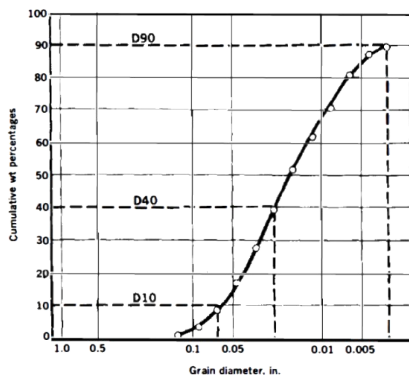


- Why is the need to do downhole calibration of spinners? (2)
- Can a Diverter Basket Flow Spinner be calibrated in this manner? (2)
- How would the curves look like if the Well was not in Shut-In but was flowing up at 25 fpm? (4)

9. During a Typical Cement Retainer Squeeze Operation,

- why is there a need to Dump Cement or Sand on the Bridge Plug before Perforating for Cement Squeeze (4)
- What kind of Perforation Charge Liner would be used for Squeeze Cementing (2)
- What is the main difference between a Cement Retainer and a Packer (2)

10. In the Schwartz method for Gravel Sizing, a Uniformity Coefficient or U_c is D_{40}/D_{90}



- For the graph given on left side, What is the value U_c ? Please note that the x axis is logarithmic with lines at 1.0, 0.5, 0.1, 0.05, 0.01, 0.005? (4)
- How will the shape of the Curve change if sorting is improved? Please draw on Answer sheet (4)

Section-C

2X20=40

11. You are the Reservoir Engineer and in-charge of a group of wells in your assigned Reservoir. Based on past experience, you are aware that five wells in your area will require Intervention in the next year. All these five wells have (20)

- a. Well Deviation of more than 75 degrees.
- b. Producing Oil with increasing Water Cut trend
- c. Intervention Job most likely would be identify source of water and then shutoff that zone
- d. There is a low possibility of Sanding

Your department has been given a specific budget to accomplish this Intervention job. You are now required to look at all Options and recommend the best possible Intervention Method and Services including a Program. A Slickline Unit and some Memory Production Logging Tools are already available in-house within the department

Your report should specifically address the issues like

- a. Would a Workover Rig be needed?
- b. Would a Tractor be needed?
- c. Can the Slickline Unit and Memory Production Logging Tools available in house, be used in the five wells
- d. Will a Coiled Tubing Unit be needed?
- e. If an Electric Wireline Logging company needs to be used, then what all Services should they provide

12. Do any one of the two options (a OR b) below. (both options carry equal marks)

- a. Mention all the different Chemical additives is used in Hydraulic Fracturing with a brief description of each along with example (20)

OR

- b. Mention all the different Chemical additives is used in Matrix Acidizing Job with a brief description of each along with example (20)