

اجب عن جميع الاسئلة

Question(1): (12 Marks)

1. Write down the main factors governing the selection of the drilling fluid
2. List four types of test equipment needed to perform the diagnostic test recommended by API
3. Discuss the advantages and disadvantages of using oil base mud
4. A rotational viscometer containing a Newtonian fluid gives a dial reading of 12 at a rotor speed of 300 rpm and a dial reading of 20 at a rotor speed of 600 rpm. Compute the apparent viscosity of the mud at each rotor speed. Also compute the plastic viscosity and yield point.

Question(2): (21 Marks)

1. List four steps in the manufacture of Portland cement?
2. Name four crystalline compounds phases in Portland cement that hydrate when mixed with water?
3. Oxides analysis of a cement is as follows:

| Oxides | Weight percent (%) |
|--|--------------------|
| Lime (CaO or C) | 66.5 |
| Silica (SiO ₂ or S) | 21.1 |
| Alumina (Al ₂ O ₃ or A) | 4.8 |
| Ferric oxide (Fe ₂ O ₃ or F) | 2.6 |
| Magnesia(MgO) | 1.2 |
| Sulfur trioxides (SO ₃) | 2.7 |
| Ignition loss | 0.9 |

Calculate the percentages of C₃S, C₂S, C₃A, and C₄AF.

4. Define the following:
 - a. Minimum water content
 - b. Yield strength
 - c. Burst pressure
 - d. Maximum water content
5. List two common cement weighting agents?
6. Name four types of cement additives?

بأتمنى الا سئد خلف الصفة

Question(3): (9Marks)

1. Discuss the function of the following casing strings:
 - a. conductor casing
 - b. surface casing
 - c. production casing
2. What is the advantage of using a liner rather than a full-length casing string?
3. Compute the body yield strength for 10.75 in, J-55 casing with a nominal wall thickness of 0.35 in, and nominal weight per foot of 45.4 lbm/ft?

Question(4): (18 Marks)

1. List the four methods used to select optimum bit?
2. Give an account of the advantages of using poly crystalline diamond compact (PDC)?
3. Name the two types of roller bit teeth in use today?
4. A recommended bit program is being prepared for a new well using bit performance records. Drilling performance record for these bits are shown for a thick limestone formations at 9000 ft. determine which bit gives the lowest drilling cost if the operating cost of the rig is \$400/hr, the trip time is 7 hours, and connection time is 1 minute per connection. Assume that each of bits was operated at near minimum cost per foot attainable for that bit.

| Bit | Bit cost (\$) | Rotating time (hours) | Connection time (hours) | Mean penetration rate |
|-----|---------------|-----------------------|-------------------------|-----------------------|
| A | 800 | 14.8 | 0.1 | 13.8 |
| B | 4900 | 57.7 | 0.4 | 12.6 |
| C | 4500 | 95.8 | 0.5 | 10.2 |

5. The cement tensile strength required to support the weight of string of casing is estimated to be 8 psi. if the cement is known to have a compressive strength of 200 psi , do you think the casing could be supported by the cement? Why?

انتهت الأسئلة