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| فصل ربيع 2016 جامعة مصراته/ كلية الهندسة | القسم/ هندسة النفط |
| الامتحان النهائي لمقرر: هندسة حفر (هـ ن312) | الزمن : ساعتان ونصف |
| التاريخ: 30 / 5 /2016 م | أستاذ المادة: د. عبد الحكم الطيب |
| اسم الطالب:..... | رقم القيد:..... |

**اجب عن جميع الاسئلة**

## Question (1) 10 marks

Put " X " or " √ " between the bracket

1. Chemical which reduce the setting time of cement system is called retarders ( )
2. Material which increase the density of a cement system is named as weighting agent ( )
3. Filter press is used for determining filtrate rate of the set cement ( )
4. Rotational viscometer used for determining the yield point of the cement

slurry ( )

5. Drilling fluids is used in the rotary drilling process to Cool and lubricate the rotating drilling string and bit ( )
6. Larger the bit nozzles, the greater the pressure drop ( )
7. Range 1(R-1) includes joint lengths in range of 16 to 26 ft. ( )
8. Alkalinity refers to the ability of a solution or mixture to react with an acid ( )
9. Surface casing setting depths are usually from 300 to 5000 ft. ( )
10. The principal advantage of a liner is its high cost ( )

## Question (2 ) 10 marks

Tick the right answer

1. The body yield strength for $13\,^{3}/_{8}$ in C-75 casing with a nominal wall thickness of 0.480 in. and nominal weight per foot of 68 lbm/ft. is:

A. 1430 lbf.
B. 1415 lbf.
C. 1458 lbf.
D. 1516 lbf.

2. The average velocity inside drill-pipe having an ID of 4.670 in, and OD of 5.5 in with flow rate of 750 gpm is equals to:

A. 752.6 ft/min
B. 842.5 ft/min
C. 654.7 ft/min
D. 519.4 ft/min

3. The burst pressure rating for $11\,^{3}/_{4}$ in L-80 casing with a nominal wall thickness of 0.489 in. and nominal weight per foot of 60 lbm/ft.

   **A.** 6730 psi
   **B.** 6478 psi
   **C.** 5826 psi
   **D.** 7314 psi

4. Neat cement slurry weights of 15.8 ppg has a density gradient equal to:
   **A.** 0.766 psi/ft
   **B.** 0.822 psi/ft
   **C.** 0.685 psi/ft
   **D.** 0.545 psi/ft

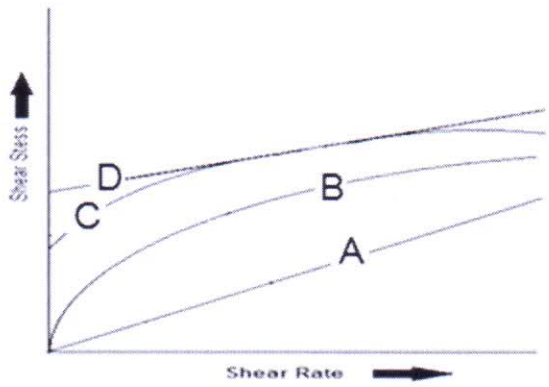
5. The static mud density required to prevent flow from a permeable stratum at 13500 ft. having formation fluid pore pressure of 7540 psig.:
   **A.** 12.4 ppg
   **B.** 11.5 ppg
   **C.** 11.8 ppg
   **D.** 10.7 ppg

## Question (3) 10 marks

1. Complete the following table with the correct form

| Test name | objective | units |
|---|---|---|
| Sand content | | |
| Mud balance | | |
| Consist-meter | | |
| Calcium hardness | | |
| Specimen mold | | |
| Filter press | | |

2. Referred to diagram shown below, write each curve name indicated by the letters, A,B,C, and D



## Question (4 ) 20 marks

Compute the corrected collapse pressure rating for 20 in., K -55 casing for in service conditions where the axial tension will be 1,000,000 lbf. Also, compute the minimum external pressure required for failure if the internal pressure will be 1,000 pisg.

The following values are given by API for K-55 casing:

Body tension rating = 2,125,500 lbf.

Non stressed collapse rating =1,490 psi

Burst rating=3,060 psi

Wall thickness = 0.635 in

Inside diameter = 18.730 in

Outside diameter = 20 in

Steel area = 38. 631sq in$^2$

$$(\sigma_{yield})_e = (Y)$$

$$F_1 = 2.8762 + 0.10679 \times 10^{-5}(Y) + 0.21301 \times 10^{-10}(Y)^2 - 0.53132 \times 10^{-16}(Y)^3$$

$$F_2 = 0.026233 + 0.50609 \times 10^{-6}(Y)$$

$$F_4 = \frac{46.95 \times 10^6 \left[\frac{3(F_2/F_1)}{2+(F_2/F_1)}\right]^3}{(Y)\left[\frac{3(F_2/F_1)}{2+(F_2/F_1)} - (F_2/F_1)\right]\left[1 - \frac{3(F_2/F_1)}{2+(F_2/F_1)}\right]^2}$$

$$F_5 = F_4(F_2/F_1)$$

انتهت الاسئلة