I D NO.	

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 40 % Max Marks: 40 Max Time: 2 hrs. 11 May Friday 2018

ENDTERM FINAL EXAMINATION MAY 2018
SET 1

Even Semester 2017-18 Course: **PET 208 Drilling Engineering** IV Sem. **Petroleum**

Instructions:

(i) *Read the question properly and answer accordingly.*
(ii) *Question paper consists of 3 parts.*
(iii) Scientific and Non-programmable calculators are permitted

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Part A

(12Q x1M = 12 Marks)

1. Answer all Question

a. Which type casing cannot accommodate BOP?
b. Which is the most commonly used Cement?
c. Give two example of oil well cement that can be used in HPHT environment.
d. Which gas we use in accumulators?
e. What is the function of “POOR BOY DEGASER”?
f. What is the use of centralizer?
g. What is cement yield?
h. What is the full form of IADC?
i. Which Drill bit is also known as “FISH TAIL BIT”?
j. Which component of Drill string acts as a Secondary BOP?
k. What is the trade name for C_3S?
l. What is float collar?

Part B (Any SIX)

(6 Q x 3 M = 18 Marks)

2. Write the difference between:
    a. Hard shut-in and Soft shut-in
    b. Primary and Secondary cementing
3. What is Thickening time? What are Cement accelerators and retarders? Give examples for each.
4. Write three functions of Oil well cement.
5. List out the causes that leads to Deep water horizon.
6. Write the functions of the following:
    a. VBR
    b. Pipe Ram
    c. Blind Ram
7. What are the objectives of Squeeze cementing?
8. What are the functions of BOP?
9. Write two advantage and a disadvantage of Liner.

Part C (ANY TWO)

(2Q x 5 M = 10 Marks)

10. Explain Single stage cementing with a proper diagram.
11. Write in detail about Air drilling.
12. What is Hesitation squeeze cementing? Write a short note on “Dump Bailer” plugging method.
13. Explain the entire classification for roller cone bit.
14. Briefly explain how the following factors helps us detecting a kick:
    a. Increase in the pit volume
    b. Detection of Gas and water cut mud
15. Explain the pressure variation in the annulus during well killing operation with a diagram.
16. During drilling of an oil well the Driller has encounter a kick. He stop the rotation and bring the tool joint above the BOP and also seal annulus and drill string. The stabilize values are:
    DPSIP=50 Psi

CSIP=150 Psi

Hole specification are as follows,

Hole depth= 8000 ft.

Hole size = 8”

Drill Pipe size=5”×4”

Initial mud weight= 50 pcf

Calculate,

a. Hydrostatic head at the bottom of drillpipe.
b. Formation pressure
c. Kill mud density in **PPG** required to completely kill the well
d. Amount of kill mud required in **BBL** to fill the entire hole.

17. An exploratory well has the following specifications,

Depth (ft.)	Hole Size(inch)	Casing size(inch)	Mud Weight Used(pcf)	Formation Fluid Gradient (Psi/ft.)
0-500(CASED)	20	18	50	0.465
500-5000(OPEN)	15	12	60	

Calculate Burst Pressure at Casing shoe and Surface.

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 20 Max Time: 1 hr. 23 Feb Friday 2018

TEST – 1

Even Semester 2017-18 Course: **PET 208 Drilling Engineering** IV Sem. Petroleum

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Instruction:

(i) Read the question properly and answer accordingly.
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Part A

(4 Q x 1 M = 04 Marks)

1. What is i-BOP and where it located?
2. "SPRIAL or SQUARE"- which is better drill collar and why?
3. What do you mean by "WASH OUT" of drill pipe?
4. "An X95 grade drill pipe has a length 43 ft. with minimum wall thickness 55% and increase metal thickness inside of the drill pipe where the couplings are threaded." Write down its RANGE and Class and how it is manufactured as a seamless pipe.

Part B

(4 Q x 2 M = 08 Marks)

5. What do you mean by "NEUTRAL POINT" of a drill string? Write about its location and significance?
6. What are the difference between MAST and DERRICK?
7. Give two example, each for "Inert fraction" of drilling fluid and "Mud thinners" added to drilling fluid
8. Design mud plan for a well where the lithological characteristics are as follows:

0-1500ft.	NORMAL FORMATION
1500-4500 ft.	GYPSUM & ANHYDRATE FORMATION
4500-7950 ft.	SHALE SWELLING FORMATION
7950-10000 ft.	HPHT

Part C

(1Q x 8 M = 8 Marks)

9. An exploratory team is drilling a well near “Gorompani” area Golaghat district Assam. According to the mud plan they are supposed to drill with a 10 ppg mud sample. Since the bore hole condition is too much hostile they decided to make the mud density 12 ppg by adding Ilmanite. For that they brought 15 sack of Ilmanite and mixed with drilling mud and start drilling. The hole depth is 25000 ft. The drill string policy is as follows

Sl No.	DEPTH (ft.)	DIMENTION	GRADE	NOMINAL WEIGHT(ppf)	CLASS
1	450	6 “× 3.40625”	D/C	44	-
2	500	73/4” × 213/16”	HWDP	77	-
3	7480	4.5”	S 135	20	Class 2
4	7570	5.5”	S 135	24.7	Class 2
5	9000	5.5”	E	24.7	Class 2

Check for Length and Safety factor for each drill pipe and conclude whether the design is safe or not.

Given Safety factor for the entire design is=1.35(Tensile)

Density of Steel=65.5 ppg

TABLE 2.4(a) Used drillpipe torsional and tensile data API Class 2. (Courtesy of API[4])

1	2	3	4	5	6	7	8	9	10
Size OD (in)	New wt. nom. wt./ thds and couplings (lb/ft)	Torsional yield strength based on eccentric wear (ft-lb)*†				Tensile data based on uniform wear load at minimum yield strength (lb)†			
		E	X95	G105	S135	E	X95	G105	S135
2⅜	4.85	3150	3990	4410	5670	76 880	97 380	107 640	138 380
	6.65	4150	5260	5810	7470	107 620	136 330	150 680	193 730
2⅞	6.85	5340	6770	7480	9620	106 950	135 470	149 730	192 510
	10.40	7680	9720	10 750	13 820	166 500	210 900	233 100	299 700
3½	9.50	9350	11 840	13 090	16 830	153 000	193 800	214 200	275 400
	13.30	12 310	15 590	17 230	22 160	212 250	268 850	297 150	382 050
	15.50	14 010	17 750	19 620	25 220	250 500	317 300	350 700	450 900
4	11.85	12 860	16 290	18 000	23 140	182 020	230 560	254 840	327 640
	14.00	15 410	19 520	21 580	27 740	224 180	283 960	313 850	403 520
	15.70	17 110	21 670	23 950	30 790	253 880	321 580	355 430	456 980
4½	13.75	17 090	21 650	23 930	30 760	213 220	270 080	298 510	383 800
	16.60	20 370	25 800	28 520	36 660	260 100	329 460	364 140	468 180
	20.00	24 460	30 980	34 240	44 030	322 950	409 070	452 130	581 310
	22.82	26 590	34 400	38 020	48 880	367 570	465 590	514 590	661 620
5	16.25	23 110	29 280	32 360	41 600	259 120	328 220	362 780	466 420
	19.50	27 210	34 460	38 090	48 970	311 540	394 600	436 150	560 760
	25.60	34 650	43 900	48 520	62 380	414 690	525 270	580 570	746 440
5½	21.90	33 480	42 410	46 870	60 260	344 780	436 720	482 690	620 600
	24.70	37 410	47 380	52 370	67 330	391 280	495 630	547 800	704 310

Table 1.1 for class 2