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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: M.TECH/PE
Subject (Course): Drilling Engineering
Course Code : PEAU7001
No. of page/s:03

Semester – I
Max. Marks : 100
Duration : 3 Hrs

SECTION-A:

5*4=20M

- 1) Differentiate between Single stage Cementation and Multi stage Cementation?
- 2) Explain about Top Drive and Kelly Drive?
- 3) State any “SEVEN” problems that can occur during drilling and explain their effect on the drilling process?
- 4) Explain the different reasons for casing off formations?
- 5) List the personals involved in preparation of GTO and what parameters can we obtain from GTO?

SECTION-B:

5*8=40M

- 1)
 - a. Explain the importance of “Trip Tank”? (4M)
 - b. Explain about “Squeeze Cementing”? (4M)
- 2)
 - a. What are the differences between Soft shut in and Hard shut in procedures? (4M)
 - b. Explain the functions of cement head, wiper plugs and spacer fluids? (4M)
- 3) Explain in detail about different types of drilling fluids? (8M)
- 4) Define the following terms (8M)
 - a) Well Head.
 - b) H.W.D.P.
 - c) Casing Hanger.
 - d) Blind RAM
 - f) TSP Bits.
 - g) Blooey Line.
 - h) Draw Works
 - i) Deadline Anchor.
- 5) Write short notes on Well Control Equipment? (8M)

SECTION-C:

2*20=40M

- Instructions:** i) Question 1 is Compulsory.
ii) Answer any one question from 2 and 3.

- 1)
 - a. Mention any 6 properties of a drilling fluid and explain their importance? (10M)
 - b. List and describe the functions of each of the component parts of the hoisting system on a conventional land drilling rig? (10M)
- 2)
 - a. Analyze the different considerations for planning a directional well? (5M)
 - b. Analyze the main factors that influence the pressure loss when circulating fluid through the drill string and annulus during drilling? (5M)
 - c. Analyze and compare positive kick indicators and early warning sign kick indicators? (5M)
 - d. Explain the applications of directional drilling? (5M)
- 3) Use the below data and calculate the burst and collapse loads that would be used to select an appropriate weight and grade of casing for the Surface, Intermediate and Production strings in this land well? (20M)

HOLE SIZE DEPTH (FT)	CASING SIZE (IN)	Expected MIN./MAX. PORE PRESSURE GRAD. (PPG)	Expected LOT PRESSURE GRAD. (PPG)	MUDWEIGHT (PPG)	CEMENTING DATA				POTENTIAL HOLE PROBLEMS
					TOC	LEAD SLURRY (PPG)	TAIL SLURRY (PPG)	MIXWATER (PPG)	
Driven 100	30"	-	-	-	-	-	-	-	
26" 3000	20"	8.6	13.0 @ 3000'	9.0	seabed	13.5	15.88 500ft	8.5	Unconsolidated Caving/Sloughing
17 1/2" 6000	13 3/8"	8.6/9.5	16.0 @ 6000'	11.00	4300	13.5	15.88 500ft	8.5	Possible Lost Circ.
12 1/4" 10000	9 5/8"	9.5/11.0	16.5 @ 10000'	14.00	7500	13.5	15.88 500ft	8.5	Unstable Shales
8 1/2" 9500 - 12000	7" L	11.0/14.0		15.00	9500	15.88	15.88 500ft	8.5	Overpressured Shales

ASSUMPTIONS :

- Gas density above 10000ft :
- Design Factor (Burst):
- Design Factor (Collapse):

PRODUCTION TEST DATA:

- Well test completion fluid density: 8.60 ppg;
- Test packer depth: 11000 ft TVD RKB;
- Test perforation depth: 11250 ft TVD RKB;