

Name:

Enrolment No:



## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2022

Programme Name: B.Tech. (APEG)

Semester : IV

Course Name : Drilling Technology

Time : 3 Hrs.

Course Code : PEAU2009

Max. Marks : 100

Nos. of page(s) : 2

### Instructions:

1. All questions are compulsory
2. Attempt questions in order. All parts of the question must be attempted together
3. Assume any missing data, if any

S. No.	Section - A (5x4 = 20)	Marks	CO						
Q1	Elaborate on the features of kelly used in rotary drilling	4	CO1						
Q2	Briefly explain IADC classification of drilling bit	4	CO2						
Q3	List the main ingredients in portland cement, with a percent of each	4	CO3						
Q4	Write four applications of plug cementation technique	4	CO3						
Q5	Define normal, abnormal & sub-normal pressures considered during well control	4	CO5						
<b>Section - B (4x10 = 40)</b>									
Q6	Draw a schematic diagram illustrating a typical rig circulating system along with its flow direction and proper labelling	10	CO1						
Q7	Describe the types of casing with their functions and applications.	10	CO3						
Q8	a) Highlight the constraints on the trajectory of a deviated well	10	CO4						
	b) Determine the azimuth with respect to true north of the following wells:								
	<table border="1"><thead><tr><th>Well</th><th>Observed azimuth with respect to magnetic north</th><th>Declination</th></tr></thead><tbody><tr><td>1</td><td>N50°E</td><td>4° west</td></tr><tr><td>2</td><td>S75°W</td><td>4° west</td></tr></tbody></table>			Well	Observed azimuth with respect to magnetic north	Declination	1	N50°E	4° west
Well	Observed azimuth with respect to magnetic north	Declination							
1	N50°E	4° west							
2	S75°W	4° west							
Q9	Determine the kill mud density for a shut-in-drill pipe pressure of 600 psi at a depth of 12,000 ft. If the original mud weight is 14.5 ppg and the slow circulating pump pressure is 850 psi, find also the standpipe pressure at start	10	CO5						

	of circulation and final circulating pressure of the system. Assume safety margin of 500 psi		
	<b>Section - C (2x20 = 40)</b>		
<b>Q10</b>	a) Discuss the functions of drilling fluid (Marks - 10) b) 8 wt. % water-bentonite mud is to be weighted by adding barite so that the final mud weight is 75 pcf. Calculate the quantity of barite in sacks, required to prepare 943 bbl of this weighted mud. (Marks - 10)	<b>20</b>	<b>CO2</b>
<b>Q11</b>	a) What are the objectives of well completion? (Marks - 7) b) Discuss advantages and disadvantages of dual completion (Marks - 7) c) Draw a illustrative diagram representing dual completion (Marks - 6)	<b>20</b>	<b>CO6</b>

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