Name:		
Enrolment No:		

UPES
End Semester Examination, May 2023

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. Assume any missing data, if any

S. No.	Section - A (5Qx4M = 20)	Marks	CO
Q1	List the different rotary drilling systems.	4	CO1
Q2	Briefly explain IADC classification of drilling bit.	4	CO2
Q3	Calculate the density of cement slurry, if 100 kg of cement is mixed with 50 liters of water.	4	CO3
Q4	Identify four application of plug cementation technique.	4	CO3
Q5	Illustrate early warning signs of a well kick.	4	CO5
	Section - B (4Qx10M = 40)		
Q6	Create a drawing of a conventional drilling rig hoisting system along with the appropriate labelling.	10	CO1
Q7	A production casing was running to a depth of 13,000 ft. When the casing was at bottom, the inside of the casing was filled with water up to the surface. If the mud weight in annulus is 15 ppg, calculate the collapse pressure at the bottom of the casing.	10	CO3
Q8	A directional driller monitors the direction of a well from a reference location point O. The well has progressed 550 meters towards east and 350 meters towards south. What is the azimuth of the bottom of the well at this location? What is the horizontal departure?	10	CO4
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, also find the standpipe pressure at start of circulation and final circulating pressure of the system. Assume safety margin of 500 psi	10	CO5
	Section - C (2Qx20M = 40)		
Q10	a) Compile the advantages and disadvantages of oil-based mud.	10+10	CO2

	b) A 1,125 bbls of drilling mud that has mud weight of 10.4 ppg was diluted using 250 bbls of water. What will be the new mud weight after dilution?		
Q11	a) Define well completion and describe the factors that influence the design of well completions. b) Discuss advantages and disadvantages of dual completion.	**10+10**	**CO6**

****