



# PRESIDENCY UNIVERSITY

BENGALURU

Roll No.																			
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## Mid - Term Examinations - March 2026

Date: 11-03- 2026

Time: 11.45am to 01.15pm

<b>School:</b> SOE	<b>Program:</b> B.Tech.-PET		
<b>Course Code:</b> PET3005	<b>Course Name:</b> Multilateral and Horizontal Well Technology		
<b>Semester:</b> VI	<b>Max Marks:</b> 50	<b>Weightage:</b> 25%	

CO - Levels	C01	C02	C03	C04	C05
Marks	24	10	16	-	-

### Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

### Part A

Answer ALL the Questions. Each question carries 2 marks.

5Q x 2M=10M

1	Outline mathematically how the Extended Reach well varies from a normal horizontal well.	2 Marks	L1	C01
2	Describe 'Tandem Motor' used in lateral wells.	2 Marks	L1	C01
3	List some deflection tools used in 'Ultrashort Radius' HW.	2 Marks	L1	C03
4	Name the completion technique used in a 'Long Radius' HW.	2 Marks	L1	C03
5	State 'Permeability Anisotropy'.	2 Marks	L1	C03

### Part B

Answer the Questions.

Total Marks 40M

6.	a.	Differentiate between a vertical well and a horizontal well. Describe the main benefits and limitations of lateral well drilling.	10 Marks (5+5)	L2	C01
Or					

7.	a.	A HW is surveyed at two stations with the following data:				10 Marks  (2+5+3)	L2	CO1
		Station(s)	MD (ft)	Inclination (°)	Azimuth (°)			
		1	7200	85	148			
		2	7600	88	155			
Predict: 1. Build-Up Rate (BUR) in °/100 ft. 2. Dog-Leg Severity (DLS) in °/100 ft. 3. Comment whether the calculated DLS is acceptable or problematic for drilling operations.								

8.	a.	Describe the working of the 'Rotary Steerable System'. Describe its two modes relating to Bit.	10 Marks  (4+6)	L2	CO1
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**Or**

9.	a.	Explain, with suitable reasoning, how torque & drag, hole cleaning, severe vibration, barite sag, and cement placement manifest more severely in long horizontal sections compared to conventional wells.	10 Marks	L2	CO1
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10.	a.	Review TAML Level (1-6) of the Schlumberger configuration for multilateral wells.	10 Marks	L2	CO2
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**Or**

11.	a.	Describe the process of Pressurized Mud Cap drilling and Constant Bottomhole Pressure drilling in narrow pressured windows.	10 Marks  (5+5)	L2	CO2
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12.	a.	In an 60 acre U.S. lease size, determine the maximum lengths of a horizontal well that can be drilled using different drilling techniques. (Conditions: Well cannot cross the lease boundary and well has to stop at a certain distance from the lease boundary, i.e., typically 150 ft; specified by the U.S. regulatory body)	10 Marks	L3	CO3
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**Or**

13.	a.	Determine the drainage area (in acres) of a well if $r_e$ is 1053 ft. Calculate the pressure drops in the damaged zones, in vertical and 1000 ft-long horizontal wells. The well test shows skin factor +1 for vertical as well as for horizontal wells. The following reservoir properties are given: $K_v = K_h = 10$ md $Q_v = 1000$ BOPD $Q_h = 2500$ BOPD $B_o = 1.06$ RB/STB $\mu_o = 0.8$ cp $h = 25$ ft	10 Marks	L3	CO3
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