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Bengaluru

Mid Term Examinations - October 2026

Date: 05/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: PET3111 **Course Name:** Advanced Well Engineering

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3
Marks	26	40	24

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Name any two key personnel responsible for floor operations on a drilling rig crew.	2	CO1	BT1
2	Identify any two types of offshore drilling units used in deepwater environments.	2	CO1	BT1
3	State the term "Fracture Gradient" with respect to drilling engineering.	2	CO1	BT1
4	List the two common units used to represent formation pressures in oilfield calculations.	2	CO3	BT1
5	Outline any two pre-drilling geophysical method used to predict abnormal pressure zones.	2	CO3	BT1

PARTB: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT
06.A	Describe the standard procedural workflow for acquiring oil and gas exploration and production licenses.	10	CO1	BT2
06.B	A drill string becomes mechanically stuck. The engineer applies an overpull of 200,000 lbs above the string's neutral weight. A surface stretch sensor measures a total pipe elongation (stretch) of 24 inches. The drill pipe has an Outer Diameter (OD) of 5 inches and an Inner Diameter (ID) of 4.276 inches (Wall thickness = 0.362 in). Calculate, at what depth (in feet) is the drill string stuck.	10	CO2	BT3
07.A	Estimate how drilling fluid travels through the surface solids removal system, and Explain how the equipment is arranged chronologically from the largest to smallest particle-size removal.	10	CO1	BT2
07.B	Demonstrate how the IADC classification code is used to classify the drill bit damages.	10	CO2	BT3

PARTC: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT
08.A	Interpret the rock-failure mechanisms of Polycrystalline Diamond Compact (PDC) bits and Roller Cone bits and explain how these differences influence the selection of each bit for different rock formations.	10	CO2	BT3

08.B	A well is being drilled at a True Vertical Depth (TVD) of 10,600 ft. The formation pore pressure at this depth is abnormally high at 6,500 psi. To maintain wellbore stability and prevent a fluid kick, a safety overbalance margin of 350 psi is required. Calculate the minimum mud density (in PPG) required drilling this section safely?	10	CO3	BT3
09.A	During a drilling operation, a bit with a Total Flow Area (TFA) of 0.30 in^2 is used. The mud flow rate is maintained at 350 gpm. If the mud density is 12 ppg, calculate the pressure drop across the bit $\Delta\square_{bit}$ in psi.	10	CO2	BT3
09.B	Illustrate various methods used for formation pressure prediction and confirmations.	10	CO3	BT3