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Bengaluru

Mid Term Examinations - October 2026

Date: 08/10/2026 **Time:** 11:45 AM - 01:15 PM

Course Code: PET2105 **Course Name:** Fundamentals of Oil and Gas Well Drilling Technology

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

CO - Levels	CO1	CO2
Marks	42	48

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Name the two major types of drilling rigs based on their location	2	CO1	BT1
2	State any two functions of the Kelly in a drilling operation.	2	CO2	BT1
3	List the five API grades of drillpipe.	2	CO2	BT1
4	Name the three standard ranges of drill pipe along with their corresponding joint lengths.	2	CO2	BT1
5	State any two surface indicators of a kick.	2	CO2	BT1

PARTB: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT
06.A	Differentiate between a kick indicator and a kick warning sign using suitable drilling parameters monitored by the well monitoring system.	10	CO1	BT2
06.B	Discuss the power and rotary systems used in drilling rigs, with emphasis on power transmission arrangements, the swivel, and top-drive system.	10	CO1	BT2
07.A	A triplex mud pump has a stroke length of 10 in, liner diameter of 5 in, operating at 70 SPM, and volumetric efficiency of 0.95. Estimate output in gpm and bpm.	10	CO1	BT2
07.B	A drilling operation requires continuous circulation of drilling fluid from the mud tank to the bottom of the well and back to the surface. Explain the mud-circulating system, including the complete flow sequence of the major components and the different types of mud pumps used in drilling operations.	10	CO1	BT2

PARTC: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT
08.A	Examine the function of a kelly in drilling operations and identify which of its two common shapes provides the stronger drive section.	10	CO2	BT3
08.B	Illustrate the API wear classes of drillpipe with suitable drilling situations where each class can be applied effectively.	10	CO2	BT3
09.A	Calculate the buoyancy factor (BF) for a drill string immersed in fresh water and the effective weight of a 20,000 lb drill string in air.	10	CO2	BT3

09.B	A 5-in OD drillpipe weighs 20 lbm/ft and has a joint length of 31 ft. The density of steel is 490 lbm/ft³. The buoyancy factor is given by: $BF = (\rho_s - \rho_m) / \rho_s$ and the apparent weight of the pipe in drilling fluid is: $W_{wet} = W_{air} \times BF$ (a) Calculate the weight of one 31-ft drillpipe joint in air. (b) Determine the buoyancy factor for drilling fluids of 11 ppg, 13 ppg, and 16 ppg. (c) Calculate the apparent (wet) weight of the 31-ft drillpipe joint for each of the three drilling-fluid densities. (d) Interpret the results and comment on the effect of increasing drilling-fluid density on the apparent weight of the drillpipe.	10	CO2	BT3