Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 08-10-2025 **Time:** 11.45am to 01.15pm

School: SOE	**Program:** B.Tech. (PET)	
Course Code : PET3011	**Course Name:** Well Intervention Technologies	
Semester: V	**Max Marks**: 50	**Weightage**: 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**24**	**26**	**-**	**-**	**-**

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 2marks. **5Q x 2M=10M**

1	State why sand control is easier in cased hole completion.	**2 Marks**	**L1**	**CO1**
2	Define “Well Stimulation” and “Well Simulation” to distinguish between them.	**2 Marks**	**L1**	**CO1**
3	Label with a simple diagram the arrangement of production tubing and packer in a cased hole completion.	**2 Marks**	**L1**	**CO2**
4	Describe the term “Live Well Intervention” in Coiled Tubing.	**2 Marks**	**L1**	**CO2**
5	List the types of pressure control equipment used with coiled tubing operations.	**2 Marks**	**L1**	**CO2**

Part B

Answer the Questions. **Total Marks 40M**

6.	(a) (b) (c) (d)	Classify the different types of well completions: open hole, cased hole, and liner completions. Describe the working principle of each method and illustrate with a labeled diagram. Compare and contrast the advantages and limitations of each completion type. Predict which completion method would be most suitable for a sandstone reservoir with moderate permeability and high water cut, and defend your choice.	**20 Marks**	**L2**	**CO1**
		Or			
7.	**a.**	Classify the different properties of workover fluids and explain their significance in minimizing formation damage and ensuring safe operations.	**10 Marks**	**L2**	**CO1**
	b.	(a) Compare coil tubing (CT) operations versus workover rig interventions in terms of live well intervention, continuous circulation, rapid mobilization and rig-up, real-time downhole monitoring, environmental impact, tripping time, crew levels, and operation cost. (b) Predict which method is more suitable under challenging well conditions (e.g., high-pressure, high-temperature) and justify your answer.	**10 Marks**	**L2**	**CO1**

8.	An oil well has shown declining production due to multiple issues, including formation damage, sand production, paraffin deposition, and partial pressure depletion. As a completion engineer, apply your knowledge of workover operations to analyze the well and determine appropriate interventions. (a) Classify the tentative reasons for production decline in this well (b) Choose suitable workover techniques for each identified problem. Justify your choices. (c) Illustrate your proposed workover scheme (d) Demonstrate how thermal stimulation, chemical injection, or mechanical methods can be employed to remove paraffin or scale. (e) Describe the use of key equipment such as cement squeezes, tubing scrapers, hydraulic fracturing tools, or artificial lift systems in the workover plan.	**20 Marks**	**L3**	**CO2**

	Solve any potential issues with mechanical failures, such as tubing leaks or packer problems, by rescheduling or restructuring the completion setup.			
	Or			
9.	An oil well has been drilled to a depth of 3,200 m in a sandstone reservoir with moderate permeability. The well is expected to produce oil with associated gas and occasional sand. The operator is preparing for well completion and long-term production. During planning, the following operational challenges are identified: (a) Safe surface control and sealing of the well. (b) Tubing must be suspended in the wellbore, with the ability to remove or replace tubing in the future without disturbing the casing. (c) Production flow needs regulation, occasional shut-in, and testing. (d) Sand production may cause erosion, especially at tubing joints. (e) Risk of scale formation requires chemical injection downhole. (f) Provision for fluid entry points for future artificial lift operations. (g) Safety during workover operations, including the ability to disconnect tubing without damaging other components. As a completion engineer, select appropriate completion equipment and justify your choices. Explain how each selected equipment addresses the specific operational challenges. Additionally, illustrate your proposed completion scheme with a labeled sketch.	**20 Marks**	**L3**	**CO2**