



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.														
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Mid - Term Examinations - March 2026

Date: 11-03- 2026

Time: 11.45am to 01.15pm

School: SOE	Program: B.Tech. (PET)		
Course Code: PET2023	Course Name: Design in Production Engineering		
Semester: VI	Max Marks: 50	Weightage: 25%	

CO - Levels	CO1	CO2	CO3	CO4	CO5	CO6
Marks	10	20	20			

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	Identify the two main purposes of perforation.	2 Marks	L1	CO1
2	Describe the relationship between clearance and the length of penetration in perforation geometry.	2 Marks	L2	CO1
3	Classify different types of perforating guns used in oil and gas industry.	2 Marks	L2	CO1
4	List the types of bullets used while doing the bullet perforation.	2 Marks	L1	CO1
5	Describe the different components of jet perforator.	2 Marks	L2	CO1

Part B

Answer the Questions.

Total Marks 40M

6.	a.	With suitable diagrams, illustrate the principle of continuous gas lift and determine the role of injection gas pressure and gas-liquid ratio in maintaining stable production.	10 Marks	L3	CO2
	b.	A vertical oil well is to be designed for continuous gas lift using the constant pressure drop method. Given data: Well depth = 2400 m, Tubing head pressure = 900 kPa, Casing head pressure = 4200 kPa, Tubing fluid pressure gradient = 9.5 kPa/m, Injection gas pressure gradient = 3.5 kPa/m, Desired pressure drop between valves = 700 kPa Apply the constant pressure drop method to: I. Determine the depths of unloading valves, II. Calculate tubing and casing pressures at each valve depth	10 Marks [5+5]	L3	CO3
Or					
7.	a.	Demonstrate the principle of intermittent gas lift. Examine its operating principle with continuous gas lift and state the conditions under which intermittent gas lift is preferred.	10 Marks	L3	CO2
	b.	Total well depth = 2200 m, Tubing head pressure = 850 kPa, Casing head pressure = 4000 kPa, Tubing pressure gradient = 10 kPa/m, Gas pressure gradient = 4 kPa/m, Number of unloading valves = 4 Using the constant pressure drop method, I. Calculate the pressure drop per valve, II. Determine the depth of each unloading valve, and	10 Marks [5+5]	L3	CO3

8.	a.	Illustrate the principle of gas lift as an artificial lift method and determine its advantages, limitations, and suitability for different reservoir conditions.	10 Marks	L3	CO2
	b.	A low productivity well is to be designed for intermittent gas lift using the fallback method. Given data: Tubing inside diameter = 2.5 in, Average liquid fallback velocity = 0.6 m/s, Injection gas pressure = 5000 kPa, Tubing pressure gradient = 11 kPa/m, Minimum required pressure differential for valve opening = 350 kPa Apply the fallback method to: 1. Calculate the fallback distance, 2. Determine the depth of the unloading valve, and	10 Marks [5+5]	L3	CO3

Or

9.	a.	Prepare the selection criteria for different types of gas lift systems. Determine how reservoir pressure, productivity index, and gas availability influence the choice.	10 Marks	L3	CO2
	b.	<p>A pressure-operated gas lift valve is tested on a surface test rack. Given data: Required gas injection rate = 0.25 MSCF/D, Gas density = 45 kg/m³, Discharge coefficient = 0.85, Injection pressure = 5200 kPa, Tubing pressure at valve depth = 3600 kPa, Bellows charge pressure = 3400 kPa Calculate:</p> <ol style="list-style-type: none"> 1. The required valve port area, 2. The port diameter, and 3. The test rack opening pressure of the gas lift valve. 	10 Marks [3+3+4]	L3	CO3