



PRESIDENCY UNIVERSITY

BENGALURU

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End - Term Examinations – May / June 2026

Date: 21- 05-2026

Time: 09:30am – 12:30pm

School: SOE	Program: B.Tech (PET)	
Course Code : PET2110	Course Name: Fundamentals of Oil and Gas Production Technology	
Semester: IV	Max Marks: 100	Weightage: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5	CO6
Marks	10	14	14	20	16	26

Instructions:

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

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	a. Identify the odd one out based on the characteristics of artificial lift systems. <i>Sucker Rod Pump (SRP), Electrical Submersible Pump (ESP), Gas Lift, Progressing Cavity Pump (PCP), Plunger Lift, Hydraulic Pump</i> b. Identify the odd one out based on the operational environment and limitations of artificial lift methods. <i>Sucker Rod Pump (SRP), Electrical Submersible Pump (ESP), Gas Lift, Progressing Cavity Pump (PCP), Plunger Lift, Hydraulic Pump, Jet Pump</i>	2 Marks	L1	CO2
2.	Match the following:	2 Marks	L1	CO2

	Artificial Lift System	Characteristic			
	A. Sucker Rod Pump (SRP)	1. Uses compressed gas to reduce the hydrostatic pressure and assist in lifting fluids.			
	B. Electrical Submersible Pump (ESP)	2. Works best for intermittent flow in low production wells or wells with low fluid rates.			
	C. Gas Lift	3. Suitable for deep wells and high production rates with high fluid volumes.			
	D. Progressing Cavity Pump (PCP)	4. Ideal for low production wells with high gas-to-oil ratios and high-viscosity fluids.			
	E. Plunger Lift	5. Typically used for shallow wells with low to moderate production rates.			
3.	Select from the given options: i. The _____ classification of gas lift systems refers to the process of injecting gas into the wellbore through multiple depths to optimize production, often based on pressure differences and fluid characteristics. (Continuous Flow Gas Lift/Intermittent Flow Gas Lift/Dual-String Gas Lift/Single-String Gas Lift) ii. The primary function of the _____ in a gas lift system is to allow gas to enter the wellbore at controlled intervals, ensuring that the injected gas is directed to the appropriate depth and volume to enhance fluid recovery. (Gas Lift Valve/Pumping Unit/Surface Safety Valve/Pressure Gauge)		2 Marks	L1	C03
4.	Outline the significance of Absolute Open flow.		2 Marks	L1	C03
5.	Identify any two components of Gas Lift valves and mention its working principle in one sentence each.		2 Marks	L1	C05
6.	Identify TRUE/FALSE statements: (i) The Plunger Lift system is best suited for wells with high production rates and deep reservoirs. (ii) Electrical Submersible Pumps (ESP) are suitable for wells with low gas-to-liquid ratios and low production rates.		2 Marks	L1	C05
7.	State the process of lifting fluid by Electrical Submersible Pump (ESP) from the wellbore to the surface.		2 Marks	L1	C05
8.	A Sucker Rod Pump (SRP) unit is designated by "C-540D-205-78". Identify this designation.		2 Marks	L1	C06
9.	Relate between Electrical Submersible Pump (ESP) and Progressing Cavity Pump (PCP).		2 Marks	L1	C06
10.	Define Nodal Analysis and state its objective in well performance evaluation.		2 Marks	L1	C06

Part B

Answer the Questions.

Total Marks 80M

11.	Given Data: Reservoir pressure = 2800 psi Flowing bottomhole pressure = 1700 psi Flow rate = 80 bpd Calculate: i. $q_{o\max}$ ii. q_o for $P_{wf} = 700$ psi iii. Construct a complete IPR curve of q vs. P_{wf}. (Calculate the P_{wf} values for five different flow rates.)	10 Marks	L3	C01
Or				
12.	Given data: permeability = 5md, Average reservoir pressure = 2500 psig, $h = 20$ft, skin = 5, viscosity of oil = 1.1cp, oil formation volume factor = 1.2 bbl/stb. Well spacing = 80 acres, wellbore radius = 0.365ft. Calculate: i. Absolute open flow. ii. Productivity Index. iii. Specific Productivity Index.	10 Marks	L3	C01
13.	Determine the function of each component of a gas lift valve and classify them with the help of a schematic diagram.	10 Marks	L3	C02
Or				
14.	Determine the spacing of balanced gas lift valves in a continuous gas lift system using a graphical method and suitable schematics.	10 Marks	L3	C02
15.	Classify the major surface components of an SRP and explain their functions with the help of a neat diagram.	10 Marks	L2	C03
Or				
16.	Describe the operating principle of a Sucker Rod Pump (SRP) and explain how sucker rod motion enables fluid lift and controls the action of standing and traveling valves with the help of a neat sketch.	10 Marks	L2	C03
17.	Determine the counterbalancing action of the counterweight in a pumping unit using relevant equations.	10 Marks	L3	C04
Or				
18.	Apply relevant equations to classify and explain how stretch in rods and tubing alters plunger stroke length.	10 Marks	L3	C04
19.	Given data: Depth = 7000 ft Desired rate = 1000 B/D	20 Marks	L3	C05

	Tubing size 2" I.D Flowing well- head pressure = 80 psig Static bottom hole pressure = 2600 psig Productivity index = 2 Solution gas-oil ratio = 200 scf/B Specific gravity of injection gas = 0.70 Surface operating pressure = 900 psig °API = 35 Total GOR = 600 SCF/B Bottom hole temperature = 190 °F Flowing surface temperature = 150 °F Calculate the following parameters based on the given data (use graph 1): A. Depth of the static level. B. Point of gas injection. C. Balanced point. D. Volume of gas injected.			
Or				
20.	In an oil field, all gas lift has casing pressure operated charged valve. The operating valve is located at 7000 ft depth. The pressure in the bellow is 800 psi and the tubing pressure is 650 psi at 7000 ft valve depth, the bellow area is 1 sq. inch & port size is 0.1 sq inch. The bellow pressure at 45°F is 600 psi. Calculate the following using the given data: a) Casing pressure at valve depth required to open the valve. b) Tubing effect factor. c) Tubing effect. d) Valve spread. e) Test rack opening pressure of valve. f) Bellow effect.	20 Marks	L3	C05
21.	Analyze the working principle of Electrical Submersible Pumps (ESP) with the help of a suitable schematic diagram. Provide a detailed description of its key components, and discuss the advantages and disadvantages of using a ESP in oil and gas operations.	20 Marks	L4	C06
Or				
22.	Compare the operational principles, efficiency, and suitability of PCP, ESP, Gas Lift and Rod pump for artificial lift applications.	20 Marks	L4	C06

Graph 1

