Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY/ JUNE 2025

Date: 03-06-2025 **Time:** 09:30 am – 12:30 pm

School: SOE	**Program:** B. Tech.-PET	
Course Code: PET2018	**Course Name:** Integrated Field Development and Planning	
Semester: VI	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**20**	**-**	**50**	**30**	**-**

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. **10Q x 2M=20M**

1.	Match the following: Input Parameter / Controlling Factors 1. Gross rock volume / A. Depositional environment; diagenesis 2. Porosity / B. Reservoir quality; capillary pressures 3. Hydrocarbon saturation / C. Fluid type; reservoir pressure 4. Formation volume factor / D. Shape of structure; dip; faults; OWC	**2 Marks**	**L1**	**CO3**
2.	Define the term 'economic lifetime' of a hydrocarbon field.	**2 Marks**	**L1**	**CO3**
3.	State the mathematical expression for Mobility Ratio also mention its range.	**2 Marks**	**L1**	**CO3**

4.	Match the following: **Statements** / **EOR Methods** **P.** Increase in sweep efficiency at the macroscopic-level by increasing water viscosity — **I.** LPG injection **Q.** Increase in sweep efficiency at the macroscopic-level by decreasing oil viscosity — **II.** Surfactant flooding **R.** Increase in displacement efficiency at the pore-scale by using a miscible displacing fluid — **III.** In-situ combustion **S.** Increase in displacement efficiency at the pore-scale by reducing interfacial tension — **IV.** Polymer flooding	**2 Marks**	**L1**	**CO3**
5.	In Water-Alternating-Gas (WAG) injection, the purpose of the injection is to **I** the "relative permeability" of gas and to **II** the "mobility" of the gas. Identify the correct Option: (A) I = reduce, II = enhance (B) I = reduce, II = reduce (C) I = enhance, II = reduce (D) I = enhance, II = enhance	**2 Marks**	**L1**	**CO3**
6.	Describe in one or two sentences why data acquisition is critical during the early stages of reservoir management.	**2 Marks**	**L1**	**CO1**
7.	Identify four important disciplines that work together in an effective reservoir management team.	**2 Marks**	**L1**	**CO4**
8.	List any two key activities involved in the reservoir management process to maximize hydrocarbon recovery.	**2 Marks**	**L1**	**CO4**
9.	Define Reservoir Management.	**2 Marks**	**L1**	**CO4**
10.	List the objectives of Reservoir Management.	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Explain the main stages of the production phase in an oil and gas field, starting from the first commercial production. Discuss how reducing operating costs and increasing hydrocarbon throughput can extend field life and delay decommissioning.	**10 Marks**	**L2**	**CO1**
	b.	With the introduction of HELP, a more investor-friendly framework replaced NELP. Explain the major differences between these two policies and explain the architecture of the	**10 Marks**	**L2**	**CO1**

		Open Acreage Licensing Policy (OALP) within HELP, highlighting its role in enhancing exploration and production opportunities.			
		Or			
12.	**a.**	Discuss the complete life cycle of an oil or gas well, from initial exploration to abandonment. In your answer, describe each major phase — including exploration, appraisal, development drilling, production, and abandonment — and explain the key activities and decisions involved at every stage. Illustrate your explanation with a clear, labeled diagram showing the typical life cycle of a well. Additionally, draw and explain the cash flow profile associated with each stage, highlighting when major investments occur, when revenue generation starts, and how operational and abandonment costs impact overall profitability over the well's lifetime.	**20 Marks**	**L2**	**CO1**

13.	**a.**	Considering that the total undiscounted OPEX often exceeds the CAPEX over the lifecycle of a production field, discuss how integrating production operations and maintenance strategies into the early facility design phase influences not only economic returns but also operational efficiency, safety, and environmental sustainability.	**06 marks**	**L2**	**CO3**
	b.	Describe the operating and maintenance objectives typically set by the production operations and maintenance group for a project, and explain the key guiding elements—such as business priorities, customer responsibilities, safety systems, reservoir management, product quality, and cost control—that must be considered while formulating these objectives.	**14 Marks**	**L2**	**CO3**
		Or			
14.		Discuss in detail the various inputs provided by the production operations team during the preparation of the Field Development Plan (FDP). Highlight the significance of production specifications, capacity and availability planning, concurrent operations, monitoring and control systems, testing and metering methods, standardization of equipment, flaring and venting policies, waste disposal, utility systems, manning strategies, logistics, communication systems, and OPEX control in shaping an efficient and sustainable production framework.	**20 Marks**	**L2**	**CO3**

15.	**a.**	Describe on the different methods of decommissioning used for wells, pipelines, offshore, and land-based facilities.	**10 Marks**	**L2**	**CO3**
	b.	Describe various funding mechanisms used to manage decommissioning costs in the oil and gas industry.	**10 Marks**	**L2**	**CO3**
		Or			
16.	**a.**	Explain the process and key considerations involved in decommissioning oil and gas installations.	**10 Marks**	**L2**	**CO3**

	b.	Discuss the role of legislation and international guidelines in offshore decommissioning activities.	**10 Marks**	**L2**	**CO3**

17.		Discuss the core philosophy of reservoir management by addressing the following aspects: a. When should the process of reservoir management ideally begin to ensure maximum recovery and efficiency? b. What types of data are essential, how should they be collected, and at what stages of reservoir development should data acquisition be prioritized? c. What critical questions must be asked throughout the reservoir management process to ensure that correct decisions are made and optimal strategies are adopted? In your answer, explain the significance of timely management, describe the importance of strategic data gathering, and identify how asking the right questions influences the success of reservoir management initiatives. Support your discussion with examples wherever relevant.	**20 Marks**	**L2**	**CO4**
		Or			
18.	**a.**	Explain the importance of synergy and effective teamwork in successful reservoir management. In your answer, discuss how collaboration among multidisciplinary teams — including geologists, geophysicists, reservoir engineers, production engineers, and economists — enhances decision-making, optimizes reservoir performance, and ensures long-term recovery goals. Also, highlight the challenges that may arise due to a lack of synergy and suggest strategies to improve communication, coordination, and shared ownership of reservoir management objectives.	**10 Marks**	**L2**	**CO4**
	b.	Identify and describe one widely adopted model of team approach in reservoir management. In your answer, explain its structure, the roles of different team members, how it facilitates better communication and decision-making, and its advantages over traditional, discipline-isolated approaches. Provide examples of how this model has contributed to the success of reservoir management in practice.	**10 Marks**	**L2**	**CO4**