Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 31-05-2025 **Time:** 09:30 am – 12:30 pm

School: SOE	**Program**: B. Tech. in Petroleum Engineering	
Course Code: PET3007	**Course Name:** Enhanced Oil & Gas Recovery Techniques	
Semester: VI	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**10**	**10**	**40**	**40**	**NA**

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	Define capillary number.	**2 Marks**	**L1**	**CO3**
2	State the IFT value required for achieving complete Miscibility.	**2 Marks**	**L1**	**CO3**
3	Define first contact miscibility.	**2 Marks**	**L1**	**CO3**
4	Define multiple contact miscibility.	**2 Marks**	**L1**	**CO3**
5	Define Miscibility Rupture**.**	**2 Marks**	**L1**	**CO3**
6	State the value of favorable permeability and temperature condition required for MEOR.	**2 Marks**	**L1**	**CO4**
7	List the disadvantages of using Nanoparticle in reservoir.	**2 Marks**	**L1**	**CO4**
8	State the basic idea of Huff & Puff recovery in MEOR.	**2 Marks**	**L1**	**CO4**
9	Define Nano composites in EOR.	**2 Marks**	**L1**	**CO4**
10	State the different methods of preparing nano emulsions.	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80**

11.	Describe in detail the natural reservoir drive mechanisms that facilitate oil production during the primary recovery stage. Explain how each mechanism contributes to reservoir energy and oil displacement	**10 Marks**	**L2**	**CO1**

or

12.	Explain the key factors that affect the performance of polymer flooding in enhanced oil recovery (EOR). Describe the mechanism of polymer retention in porous media.	**10 Marks**	**L2**	**CO1**

13.	Describe in detail the fundamental mechanisms involved in forward in-situ combustion (ISC) as a thermal enhanced oil recovery (EOR) method. Draw the temperature profile and explain each temperature zone in detail.	**10 Marks**	**L2**	**CO2**

or

14.	Describe in detail the underlying mechanisms of reverse in-situ combustion (ISC) as applied in thermal enhanced oil recovery. Draw the temperature profile and explain each temperature zone in detail.	**10 Marks**	**L2**	**CO2**

15.	Describe in detail the procedure of CO_2 miscible flooding as an enhanced oil recovery (EOR) method. Explain the fundamental mechanisms associated with miscible displacement. Also, explain the CO2 flood injection design and classification in detail	**15 Marks**	**L2**	**CO3**

Or

16.	Describe in detail the various experimental methods used to determine the miscibility condition of crude oil with injected gases with proper schematics. Discuss their relevance to Enhanced Oil Recovery (EOR) studies.	**15 Marks**	**L2**	**CO3**

17.	Explain the procedure with proper slug schematic and mechanisms of Alcohol flooding with the help of Ternary phase diagram. Explain how miscibility is achieved for efficient working of Alcohol flooding.	**15 Marks**	**L2**	**CO3**

Or

18.	Explain WAG flooding in detail. Explain in detail why WAF flooding is superior than simple gas injection. Discuss in detail about Hybrid WAG injection and Simultaneous WAG injection in detail.	**15 Marks**	**L2**	**CO3**

19.	Discuss about MEOR, its objective and methods of application in detail. Explain the different types of application techniques used to apply MEOR in the petroleum Fields.	**15 Marks**	**L2**	**CO4**

	Or			
20.	Discuss in detail about the different factors to be considered for applying MEOR.	**15 Marks**	**L2**	**CO4**
21.	Explain in detail about Nano emulsion Flooding in EOR with schematics, its application, mechanisms, advantages and disadvantages in detail.	**15 Marks**	**L2**	**CO4**
	Or			
22.	Explain in detail about the Pickering emulsion. Explain how it is different from conventional emulsion technique. Also discuss the different desirable properties with explanation required for successful Nano emulsion formation and flooding.	**15 Marks**	**L2**	**CO4**