Name: Roll No:	UPES UNIVERSITY OF TOMORROW

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Sem Examination, May-2022

Programme Name: M.Tech Petroleum Engineering **Semester: II**
Course Name: Enhanced Oil Recovery Techniques **Time: 03 hrs**
Course Code: PEAU 7009 **Max. Marks: 100**
Instructions:

- **All questions are compulsory.**
- **However, internal choice has been provided. You have to attempt only one of the alternatives in all such questions.**

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q1	Define Displacement efficiency and volumetric sweep efficiency	**04**	**CO1**
Q2	Distinguish between EOR & IOR?	**04**	**CO2**
Q3	Define MMP and MMC?	**04**	**CO3**
Q4	List out the different methods of oil and gas reserves estimation.	**04**	**CO2**
Q5	Discuss about Inaccessible pore volume and viscous fingering	**04**	**CO1**

SECTION B
(4Qx10M=40 Marks)

Q 6	Explain Microbial EOR mechanism, selection criteria with examples	**10**	**CO2**
Q 7	Explain in detail about SAGD EOR process with neat sketch with reservoir specifications	**10**	**CO3**
Q 8	Mention the selection criteria and challenges associated with Miscible gas flooding process and discuss WAG process	**10**	**CO4**
Q 9	Discuss Micellar flooding process and effects of brine salinity concentration on Micellar flooding process. **OR**	**10**	**CO5**

	Explain EOR techniques and their types? Explain the Huff and Puff method with neat and clean diagram?		
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	Discuss the Drive indexes for the material balance equations. Given the following data: well's production rate at time 0, STB/day — 100 BOPD initial nominal exponential decline rate (t = 0), 1/day — 0.5/year hyperbolic exponent — 0.9 Assuming hyperbolic decline, predict the amount of oil produced for five years.	**10+10**	**CO4**
Q 11	Given the following data for the Hout oil field in Saudi Arabia Area = 26,700 acres Net productive thickness = 49 ft Porosity = 8% Average S_{wi} = 45% Initial reservoir pressure, p_i = 2980 psia Abandonment pressure, p_a = 300 psia B_o at p_i = 1.68 bbl/STB B_o at p_a = 1.15 bbl/STB S_g at p_a = 34% S_{or} after water invasion = 20% The following quantities will be calculated: 1. Initial oil in place 2. Oil in place after volumetric depletion to abandonment pressure 3. Oil in place after water invasion at initial pressure 4. Oil reserve by volumetric depletion to abandonment pressure 5. Oil reserve by full water drive 6. Discussion of results **OR** **Given the following data for an oil field**	**20**	**CO5**

		Volume of bulk oil zone	=112,000 acre-ft	**20**	**CO5**
		Volume of bulk gas zone	=19,600 acre-ft		
		Initial reservoir pressure	= 2710 psia		
		Initial oil FVF	= 1.340 bbl/STB		
		Initial gas FVF	= 0.006266 ft_3/SCF		
		Initial dissolved GOR	= 562 SCF/STB		
		Oil produced during the interval	= 20 MM STB		
		Reservoir pressure at the end of the interval	= 2000 psia		
		Average produced GOR	= 700 SCF/STB		
		Two-phase FVF at 2000 psia	= 1.4954 bbl/STB		
		Volume of water encroached	= 11.58 MM bbl		
		Volume of water produced	= 1.05 MM STB		
		Water FVF	= 1.028 bbl/STB		
		Gas FVF at 2000 psia	= 0.008479 ft_3/SCF		

1. The stock tank oil initially in place.
2. The driving indexes.
3. Discussion of results.

All the Best!!