

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2019

Course: Enhanced Oil Recovery

Semester: VI/VIII

Program: B. Tech APE Gas

Time 03 hrs.

Course Code: PTEG427

Max. Marks: 100

Instructions: Answer all the questions of a section in sequence. Missing data may be assumed reasonably.

SECTION A (30 Marks)

S. No.		Marks	CO
Q 1	Define volumetric sweep efficiency and overall displacement efficiency.	6	CO1
Q 2	Production of a well has declined from 100 stb/d to 96 stb/d during one-month period. Using the exponential decline model, predict the production rate at the end of 1 year.	6	CO1
Q 3	Give the schematic of an idealized FCM displacement process.	6	CO2
Q 4	What is the effect of permeability and pressure in selecting a suitable thermal recovery process?	6	CO3
Q 5	Discuss the applications of foam as an EOR agent.	6	CO4

SECTION B (40 Marks)

Q 6	(i) Write notes on the mechanism proposed by Zick for MCM processes. (ii) An FCM process is to be designed in which a slug of butane is the primary displacing solvent. The butane slug is to be displaced by dry gas consisting essentially methane. Assume that the crude oil is represented (in phase behavior sense) by n-undecane and reservoir conditions are 160 °F and 2500 psi. Determine whether miscible conditions would exist at the front and back of the solvent slug.	7+8	CO2
Q 7	(i) Discuss the effect of pressure on miscibility with the help of ternary diagrams. (ii) Explain the two distinct combustion regimes that exist in in-situ combustion process?	5 5	CO2 CO3
Q 8	(i) Write the structures of polyacrylamide and partially hydrolyzed polyacrylamide and explain why one is preferred over other for EOR applications. (ii) Write short notes on the following – Hybrid WAG and Simultaneous WAG.	7+8	CO4

SECTION-C (30 Marks)

Q 9	A sandstone reservoir with a porosity of 25% contains an oil saturation of 0.2 and a water saturation of 0.8. Steam is to be injected into the reservoir at a rate of 500 BWPD CWE. The steam has 85% quality, at a pressure of 500 psig at the sandface. Reservoir thickness is 20 ft. The thermal conductivity of the overburden, k_h , is 1.5 Btu/hr-ft-°F and the thermal diffusivity of the overburden, α , is 0.0482 ft ² /hr. Find the radius of the heated area and the rate of increase in heated area after 3 weeks of continuous injection, assuming the area to be in cylindrical shape. Take the volumetric heat capacity of heated region to be 34.27 Btu/ft ³ -°F.	15	CO3
Q 10	Describe the two mechanisms of MEOR that have the greatest effect on improving oil recovery, in detail. What are the problems associated with MEOR?	10+5	CO4