

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

END Semester Examination, May 2019

Programme Name: M.Tech. (PE)
Course Name : Enhanced Oil Recovery Techniques
Course Code : PEAU 7009
Nos. of page(s) : 1

Semester : II
Time : 03 hrs
Max. Marks : 100

Instructions: Answer All Questions

SNo	SECTION A	Marks	CO
Q 1	Comment on various stages of oil recovery methods	5	CO1
Q 2	Define coning. Comment on factors contributing to coning	5	CO2
Q 3	List the screening criteria for Microbial EOR operation	5	CO3
Q 4	Comment on SAGD enhanced oil recovery method	5	CO4
SECTION B			
Q 5	Explain in detail about any one pressure maintenance secondary recovery operation	10	CO1
Q 6	Elaborate on various well patterns available for improving the sweep efficiencies during flooding operations	10	CO1
Q 7	Derive an expression for evaluating oil recovery during an immiscible displacement from a stratified reservoir OR Derive an expression for velocity of a plane of constant water saturation displacing oil through linear system by Buckley-Leverett approach	10	CO2
Q 8	Following is the data of immiscible displacement in a reservoir of 200 m X 200 m pattern: Porosity – 20%; oil saturation – 65%; residual oil saturation – 25%; mobility ratio – 1.32; pay thickness – 5 zones of 1 m each; permeability of zones – 310, 187, 432, 187 and 64 md. Calculate: a. Fractional flow of water b. Oil recovery by stiles’ method if the water break through is in 2 nd layer	10	CO2
SECTION-C			
Q 9	Classify Enhanced Oil Recovery (EOR) methods available for improving oil recoveries. Demonstrate with a neat diagram the working of microbial enhanced oil recovery operation. OR With a neat diagram, demonstrate in detail about Alkali-Surfactant-Polymer (ASP) flooding operation.	20	CO3
Q10	Classify various Thermal Enhanced Oil Recovery (TEOR) methods and explain in detail about in-situ combustion enhanced oil recovery operation.	20	CO4

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

END Semester Examination, May 2019

Programme Name: M.Tech. (PE)

Course Name : Enhanced Oil Recovery Techniques

Course Code : PEAU 7009

Nos. of page(s) : 1

Semester : II

Time : 03 hrs

Max. Marks : 100

Instructions: Answer All Questions

SNo	SECTION A	Marks	CO
Q 1	Define capillary number and comment on its importance in tertiary recovery methods	5	CO1
Q 2	Define fractional flow of water	5	CO2
Q 3	List any two alkali, surfactant and polymer chemicals used in chemical EOR operations	5	CO3
Q 4	List the screening criteria for in-situ combustion EOR operation	5	CO4
SECTION B			
Q 5	Elaborate on various well patterns available for improving the sweep efficiencies during flooding operations.	10	CO1
Q 6	Following is the data from water flood operation from a 5-spot well pattern: Well spacing – 40 acre; injection rate - 200 RB/day; pay thickness – 15 ft; porosity – 20%; oil formation volume factor – 1.25; initial oil saturation – 70%; residual oil saturation – 30%; oil viscosity – 5 cp; water viscosity – 0.8 cp Kro - 0.75; K _{rw} – 0.25. Calculate: a. volume of displaceable oil b. mobility ratio c. displacement efficiency d. overall recovery if the volumetric sweep efficiency is 60%	10	CO1
Q 7	Derive an expression for evaluating oil recovery during an immiscible displacement from a stratified reservoir	10	CO2
Q 8	Derive an expression for velocity of a plane of constant water saturation displacing oil through linear system by Buckley-Leverett approach. OR Following is the data of immiscible displacement in a reservoir of 200 m X 200 m pattern: Porosity – 20%; oil saturation – 65%; residual oil saturation – 25%; mobility ratio – 1.32; pay thickness – 5 zones of 1 m each; permeability of zones – 310, 187, 432, 187 and 64 md. Calculate: a. Fractional flow of water b. Oil recovery by stiles' method if the water break through is in 3 rd layer	10	CO2
SECTION-C			
Q 9	Classify Enhanced Oil Recovery (EOR) methods available for improving oil recoveries. Compare and contrast between various EOR methods. OR With a neat diagram, demonstrate about Alkali-Surfactant-Polymer (ASP) flooding process	20	CO3
Q10	Elaborate in detail about miscible and immiscible gas flooding operations.	20	CO4