

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, December 2020

Programme : B.TECH APE GAS

Semester : VII

Course Name : Enhanced Oil Recovery

Time : 03 hrs.

Course Code : CHGS 3014

Max. Marks: 100

Nos of Page(s) : 03

Instructions: All questions are Compulsory

SECTION A

1. Each Question will carry 5 Marks

2. Instruction: Complete the statement / Select the correct answer(s)

S. No.		Marks	CO
Q 1	a) Secondary recovery results from the augmentation of natural energy through injection of gas to displace water through producing wells- True or False. b) Product of microscopic and macroscopic displacement efficiencies is termed as ----- c) Displacement of oil at a pore scale is termed as----- d) Density factor between displacing fluids and displaced fluids is considered for----- e) Effectiveness of displacing fluids in volumetric sense is termed as-----	5M	CO1
Q 2	a) Water Flooding perhaps comes under primary recovery method-True or False. b) Water injection should be initiated when the reservoir pressure reaches i) Volatile point ii) Bubble point. iii) Condensation Point. iv) None of the above. c) Sweeping efficiency of oil will increase if the oil viscosity is ----- d) In gas injection projects, the desired percentage of gas saturation in oil zone is- i) 10% ii) 15% iii) 20% iv) 0% e) Cost of injection relates to ----- parameter.	5M	CO2
Q 3	a) Sum of producible oil and non-producible oil is termed as----- (1M) b) Ratio of total oil in place to producible oil is called recovery factor – True or False. (1M) c) Level of uncertainty in reserve estimation is due to -----, ----- and ----- properties. (3M)	5M	CO3

Q 4	<p>a) Efficiency of EOR = sweep efficiency * displacement efficiency * recovery factor - True or False.</p> <p>b) Mobility ratio greater than one suggests that the water moves greater than oil – True or False.</p> <p>c) The angle between the fluid interface and the direction of flow will remain constant throughout the displacement in ----- reservoir</p> <p>d) For effective water injection operations----- is considered.</p> <p>e) Surface or sub surface topology results in ----- injection patterns</p>	5M	CO4
Q 5	<p>a) Efficiency of oxidation process depends on-</p> <p>i) Flue gas concentration.</p> <p>ii) Crude oil concentration.</p> <p>iii) Injector well position.</p> <p>iv) Producer well position.</p> <p>b) Sequence of seven zones that act in forward combustion is Burned zone-combustion front-coke zone-vaporizing zone-undisturbed reservoir-condensing zone-oil bank zone – True or False.</p> <p>c) ----- amount of oxygen required to propagate the burning front in backward combustion.</p> <p>d) Percentage of heat generated that can transfer ahead of combustion front</p> <p>i) 25%</p> <p>ii) 30%</p> <p>iii) 20%</p> <p>iv) 40%</p> <p>e) Wet combustion is termed as COFCWA – True or False.</p>	5M	CO4
Q 6	<p>a) Type of flooding pattern in which the injection wells are drilled across the boundary layer is named as-----</p> <p>b) Type of flooding pattern in which the crude oil is displaced towards interior of reservoir is -----</p> <p>c) Type of flooding pattern in which the injection takes place through wells located at top of the structure is -----</p> <p>d) basal injection patterns are mostly used in -----</p> <p>e) Benefit of gravity segregation is obtained in -----flooding pattern</p>	5M	CO3

SECTION B

- 1. Each question will carry 10 marks**
2. Instruction: Write short / brief notes

Q 7	Explain how EOR gas flooding has been the most widely used recovery method in light, condensate and volatile oil carbonate reservoirs.	10M	CO2
Q 8	Discuss the principles that govern the polymer flooding operations.	10M	CO3
Q 9	Discuss the environmental risks associated with the implementation of EOR projects.	10M	CO4
Q 10	How capillary number, mobility ratio, interaction between the surfactant and rock influence the oil recovery by surfactant flooding.	10M	CO3
Q 11	Explain how the microbial processes proceedings in MEOR can be classified cording to the oil production problem in the field.	10M	CO4

SECTION-C

1. Each Question carries 20 Marks.

2. Instruction: Write long answer.

Q 12	a) Describe the various types of steam flooding and zones formed in reservoir during its flooding. (10M) b) Illustrate various reservoir properties necessary for in-situ combustion techniques together with the quantitative description of forward combustion. (10M)	20M	CO4
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