Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Program: M.Sc. Petroleum Geosciences **Semester : 3rd**
Course: Unconventional Reservoir Engineering **Time : 03 hrs.**
Course Code: PEGS8018 **Max. Marks: 100**
Nos. of page(s): 01

Instructions: All questions are compulsory. Assume if any data is missing.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Write the effect of bubble point pressure on gas oil ratio. Also define solution GOR.	**4**	**CO1**
Q 2	Describe the wettability and surface tension.	**4**	**CO1**
Q 3	Differentiate between low shrinkage oil and high shrinkage oil reservoir.	**4**	**CO1**
Q 4	Calculate the porosity on the basis of given data for a cylindrical core sample: Clean dry weight of sample = 300 gm, Weight of sample with pores completely filled (100% saturated) with a 1.05 specific gravity of brine = 320 gm, Diameter of sample = 3 cm, Length of sample = 8 cm.	**4**	**CO2**
Q 5	Explain the gas formation volume factor and oil formation volume factor.	**4**	**CO1**

SECTION B
(4Qx10M= 40 Marks)

Q 6	Explain the low-shrinkage crude oil and high-shrinkage (volatile) crude oil with the help of suitable phase diagrams.			**10**	**CO3**
Q 7	Calculate the arithmetic average and thickness-weighted average from the following measurements:			**10**	**CO2**
	Sample	Thickness, ft	Porosity, %		
	1	1.0	10		
	2	1.5	12		
	3	1.0	11		
	4	2.0	13		
	5	2.1	14		
	6	1.1	10		
Q 8	Describe the two phase relative permeability curve for oil and water system.			**10**	**CO2**

Q 9	An oil reservoir exists at its bubble-point pressure of 4000 psia and temperature of 180 °F. The oil has an API gravity of 42° and gas-oil ratio of 800 scf/STB. The following additional data are also available: • Reservoir area = 640 acres • Average thickness = 10 ft • Effective porosity = 15% Calculate the specific gravity of the stock-tank oil, pore volume and bulk volume.	**10**	**CO2**
SECTION-C (2Qx20M=40 Marks)			
Q 10	Describe the following with the help of suitable diagrams/curves: a. Depletion drive b. Gas cap drive c. Water drive d. Gravity drainage drive	**20**	**CO3**
Q 11	Discuss the material balance equation and derive an equation of initial oil in place for solution gas drive and solution gas- Gas-cap drive.	**20**	**CO4**