

ROLL NO:

PRESIDENCY UNIVERSITY, BENGALURU SCHOOL OF ENGINEERING

Weightage: 20 %

Max Marks: 20

Max Time: 1 hr.

Saturday, 22nd September, 2018

TEST - 1

Odd Semester 2018-19

Course: PET 209 Reservoir Engineering - I

V Sem. Petroleum

Instruction:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

 $(3 Q \times 2 M = 6 Marks)$

- 1. What information of rock can be obtained by RCAL and SCAL?
- 2. Define absolute porosity and write its equation in terms of interconnected, dead-end and isolated pores.
- 3. Write Darcy's equation for inclined or a dipping flow system with its notations.

Part B

 $(2 Q \times 4 M = 8 Marks)$

- 4. Define the following
 - a. Critical Point
 - b. Cricondentherm
 - c. Cricondenbar
 - d. Shrinkage
- 5. Write a short notes on black oil and draw P-T diagram of it.

Part C

 $(1 Q \times 6 M = 6 Marks)$

6. A 10 cP viscosity oil is being produced from a 150 acre drainage area where the pressure at drainage radius is 1800 psi. The radius of the wellbore is 11.43 cm, the thickness of the pay zone is 6.096 m, and the bottom hole flowing pressure is 1250 psi. The formation permeability is 100 mD. Calculate oil flow rate for a positive skin effect of 5, assuming steady state radial flow. (1 acre = 43560 ft²)



PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

TEST 2

Odd Semester: 2018-19

Date: 24 November 2018

Course Code: PET 209

Time: 1 Hour

Course Name: Reservoir Engineering - I

Max Marks: 20

Branch & Sem: PET & V Sem

Weightage: 20%

Instructions:

(i) Read the question properly and answer accordingly.

(ii) Question paper consists of 3 parts.

(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer all the Questions. Each question carries two marks.

(3x2=6)

- 1. Define sampling and where it can be done.
- 2. Describe gas formation volume factor and express its equation in terms of barrels
- 3. State Coefficient of isothermal compressibility and List out the three groups into which reservoir fluids are classified based on isothermal compressibility.

Part B

Answer all the Questions. Each question carries four marks.

(2x4=8)

- Discuss the usual experiments and calculations done in the complete PVT analysis for oil.
- 5. Using the Meyer and Garder relationships, calculate the critical oil flow rate for the following data.

A vertical well is drilled in an oil reservoir overlaid by a gas cap. The related well and reservoir data are given below:

Absolute permeability, i.e., k_h , $k_v = 110$ md

Oil relative permeability, kro = 0.85

Oil density, $\rho o = 47.5 \text{ lb/ft3}$

Gas density, $\rho g = 5.1 \text{ lb/ft3}$

Oil viscosity, $\mu o = 0.73$ cp

Oil formation volume factor, Bo = 1.1 bbl/STB

Oil column thickness, h = 40 ft

Perforated interval, hp = 15 ft

Depth from GOC to top of perforations, Dt = 25 ft

Wellbore radius, rw = 0.25 ft

Drainage radius, re = 660 ft

Part C

Answer the Question. Question carries six marks.

(1x6=6)

6. Describe any three regular injection patterns. Sketch those three regular injection patterns and also their invert patterns with notations.



Roll No.			
----------	--	--	--

PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

END TERM FINAL EXAMINATION

Odd Semester: 2018-19

Date: 26 December 2018

Course Code: PET 209

Time: 2 Hours

Course Name: Reservoir Engineering - I

Max Marks: 40

Programme & Sem: PET & V Sem

Weightage: 40%

Instructions:

(i) Read the question properly and answer accordingly.

(ii) Question paper consists of 3 parts.

(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer all the Questions. Each question carries two marks.

(2Qx2M=4)

- 1. State decline rate equation and with notations.
- 2. Name the commonly used decline curves for oil reservoirs and special curves for analysis of hydrocarbon reservoirs.

Part B

Answer all the Questions. Each question carries four marks.

(4Qx4M=16)

- 3. Explain decline curve analysis methodology.
- 4. List out the properties favorable for oil recovery.
- 5. Explain gas cap drive mechanism.
- 6. What are the assumptions to be taken for material balance equation used for reserve estimation?

Part C

Answer **all** the Questions. **Each** question carries **ten** marks.

(2Qx10M=20)

7. Reserve estimation of hydrocarbons (Initial oil and gas in place) can be done using tank model and volumetric changes. Draw such tank model and also write it in form of equation.

8. Compute initial oil in place and magnitude of each of the driving mechanisms and their contribution for the combination drive reservoir.

Reservoir Data:

The current reservoir pressure 2000 psi.

Volume of the bulk oil zone = 200000 ac-ft

Volume of bulk gas zone = 40000 ac-ft

PVT Data

	PROPERTY	INITIAL RESERVOIR CONDITION	CURRENT RESERVOIR CONDITION
	p, psi	2500	2000
	Bo, bbl/STB	1.25	1.22
	Rs, scf/STB	650	550
	Np, MMSTB	0	5
	Gp, MMMscf	0	5.5
	Bw, bbl/STB	1	encontrar to sandani
	We, MMbbl	0	3.6
	Wp, MMbbl	0	0.6
Mi-Mr-5i	Bg, bbl/scf	0.0012	0.0016
	cf, cw	0	0