

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023**

Semester : Semester VI - 2020

Course Code : PET2010

Course Name : Sem VI - PET2010 - Introduction To Oil and Gas Reservoir Simulation

Program : PET

Date : 18-APR-2023

Time : 2PM -
3.30PM

Max Marks : 50

Weightage : 25%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. Mention the oil recovery mechanisms under primary, secondary and tertiary recovery methods.
(CO1) [Knowledge]
2. Define a reservoir model. Mention the difference between modelling and simulation.
(CO1) [Knowledge]
3. List down the parameters that can be predicted using material balance equation. Define the term 'm' used in material balance equation.
(CO1) [Knowledge]
4. Define reservoir simulation and mention its purposes.
(CO1) [Knowledge]
5. Mention different stages of life cycle of oil production that comes under reservoir management and write the objective of reservoir management.
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(2 X 10 = 20M)

6. In order to develop a reservoir simulation, definite steps are followed. Mention the steps and also explain the steps with the help of flow diagram.

(CO1) [Comprehension]

7. During data preparation for reservoir simulation, the reservoir is divided into grids and different rock properties are assigned to each grid. Discuss the rock properties in detail that are assigned to the grids.

(CO1) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. A combination-drive reservoir contains 10 MMSTB of oil initially in place. The ratio of the original gas-cap volume to the original oil volume, i.e., m , is estimated as 0.25. The initial reservoir pressure is 3000 psia at 150°F. The reservoir produced 1 MMSTB of oil, 1100 MMscf of 0.8 specific gravity gas, and 50,000 STB of water by the time the reservoir pressure dropped to 2800 psi.

Interpret the following:

a) Cumulative water influx

b) Net water influx

Given,

$S_{wi} = 0.20$, $C_w = 1.5 \times 10^{-6} \text{ psi}^{-1}$, $C_f = 1 \times 10^{-6} \text{ psi}^{-1}$

The following PVT data is available:

	3000 psi	2800 psi
Bo, bbl/STB	1.58	1.48
Rs, Scf/STB	1040	850
Bg, bbl/scf	0.00080	0.00092
Bt, bbl/STB	1.58	1.655
Bw, bbl/STB	1.000	1.000

(CO1) [Application]