

Roll No



**PRESIDENCY UNIVERSITY  
BENGALURU**

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

**Semester :** Semester V - 2021

**Course Code :** PET2009

**Course Name :** Sem V - PET2009 - Thermodynamics of Reservoir Fluids

**Program :** B. TECH

**Date :** 2-NOV-2023

**Time :** 9:30AM - 11:00AM

**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 C**

**ANSWER ALL THE QUESTIONS**

**(5 X 2 = 10M)**

1. Define oil and gas formation volume factor. (CO1) [Knowledge]
2. List the inorganic and organic compounds contained in reservoir fluids. (CO1) [Knowledge]
3. Define solution gas ratio. (CO1) [Knowledge]
4. State the chemical expression for alkanes and naphthenes. (CO1) [Knowledge]
5. State the concept of equilibrium. (CO1) [Knowledge]

**PART B**

**ANSWER ALL THE QUESTIONS**

**(2 X 10 = 20M)**

6. PVT experiments provide valuable data for reservoir engineering, production optimization, and the design of oil and gas processing facilities. Describe with a neat sketch Constant mass/ composition expansion and constant volume depletion experiments used in oil and gas to collect fluid properties data. (CO1) [Comprehension]

7. Laboratory experiments involving reservoir fluids are essential for characterizing the properties and behavior of fluids found in subsurface reservoirs, such as crude oil, natural gas, and water. Elaborate on the importance of PVT Experiments and compositional analysis.

(CO1) [Comprehension]

### PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. A pressure-temperature (P-T) diagram, often referred to as a phase diagram or phase envelope, is a graphical representation that shows the phases and phase boundaries of reservoir fluids (typically oil and gas) under different pressure and temperature conditions. This diagram is crucial in the oil and gas industry for understanding and predicting the behavior of reservoir fluids. Illustrate the reservoir fluid types with their respective P-T diagram using an analytical approach.

(CO1) [Application]