Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET A

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024

Semester : Semester V - 2021

Course Code : PET2010

Course Name : Introduction to Oil and Gas Reservoir Simulation

Program : B.Tech.

Date : 05-JAN-2024
Time : 9:30AM - 12:30 PM
Max Marks : 100
Weightage : 50%

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 **4 X 5M = 20M**

1. State the features of compositional simulator (GEM).
(CO1) [Knowledge]
2. Enumerate the geological and geophysical data necessary for reservoir simulation.
(CO1) [Knowledge]
3. Describe the role of Minimum Miscibility Pressure in enhanced oil recovery.
(CO1) [Knowledge]
4. List the Data required in a cell and Block.
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **5 X 10M = 50M**

5. Reservoir simulation involves examining the fluid flow within a hydrocarbon reservoir when subjected to production conditions. Subsequent to this description, outline the benefits, drawbacks, and procedural stages associated with employing reservoir simulation in the oil and gas industry.
(CO1) [Comprehension]

6. Simulation models in reservoir engineering to ensure an accurate representation of the past while optimizing future predictions for hydrocarbon recovery, considering the inherent uncertainties and complexities of subsurface reservoirs describe the role of historical data and history matching in reservoir simulation in more detail.

(CO1) [Comprehension]

7. In reservoir engineering, simulation models play a crucial role in achieving precision in depicting past occurrences and enhancing predictions for future hydrocarbon recovery. This process involves addressing the inherent uncertainties and intricacies associated with subsurface reservoirs.Elaborate on the significance of historical data and history matching within reservoir simulation, elucidating their roles more comprehensively.

(CO1) [Comprehension]

8. Upscaling techniques for reservoir simulation to bridge the gap between high-resolution geological models and practical simulation runs, allowing for more accurate and efficient predictions of fluid flow and recovery in complex subsurface reservoirs. Describe in detail the steps, and difficulties in upscaling.

(CO1) [Comprehension]

9. Reservoir simulation is the study of how fluids flow in a hydrocarbon reservoir when put under production conditions. Following the statement enumerate the advantages, disadvantages, and steps of reservoir simulation in the oil and gas industry.

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **2 X 15M = 30M**

10. Reservoir simulation modeling entails developing computerized representations of underground reservoirs to simulate and analyze how they behave. This modeling procedure is essential in reservoir engineering, as it aids in forecasting fluid movement, estimating the retrieval of hydrocarbons, and refining production strategies. Elucidate the uncertainties in static modelling.

(CO1) [Application]

11. Material balance equations and reservoir simulation are separate tools employed in reservoir engineering for the assessment and analysis of subsurface reservoir behavior, specifically in the realm of oil and gas fields. Being a reservoir simulation engineer, distinguishes between these tools through an analytical approach in detail.

(CO1) [Application]