

Exam Date & Time: 25-Nov-2022 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

MANIPAL INSTITUTE OF TECHNOLOGY
VII SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV 2022

Introduction to Petroleum Engineering [CHE 4304]

Marks: 50

Duration: 180 mins.

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

- 1) Explain the organic theory of oil formation (3)
 - A)
 - B) Name the top producer and consumer nations of petroleum. Postulate the reasons behind their leading positions (4)
 - C) How can the "explosive detonation" technique help to locate the oilfield? (3)
- 2) What are the different steps/stages of a drilling process? How does the drilling mud prevent the "kicking" of the formation fluid from the reservoir? (4)
 - A)
 - B) Name any four components of a blowout preventer and discuss the role of any two of them (3)
 - C) Compare the effect on gas-oil ratio, reservoir pressure, and oil recovery rate of solution gas drive, gas cap drive, and water drive mechanisms during the primary recovery of oil. (3)
- 3) What is the capillary number and mobility ratio? How can they affect the recovery of residual oil present in the reservoir? (2)
 - A)
 - B) Classify the reservoir based on the initial state of the fluids and explain them. Describe any two reservoir properties that play an essential role in the production of hydrocarbon (4)
 - C) Explain the Miscible CO₂ gas injection method for the recovery of oil. Write down its advantages over the other gas injection methods (4)
- 4) Explain the importance of API gravity and Octane number (4)

- A)
- B) If the specific gravity of a petroleum product is 0.9, Calculate its API gravity and mention the type of hydrocarbon with an example (3)
- C) Name any three non-hydrocarbon species present in the crude oil. Discuss the impact of any ONE non-hydrocarbon substance if present in the petroleum product (3)
- 5) Name at least two each low-boiling, medium-boiling, and high-boiling range petroleum products present in the crude oil (2)
- A)
- B) Why there is a need of vacuum distillation of crude oil? Discuss the role of any two important units in the process flow diagram of an atmospheric distillation unit (ADU) (4)
- C) Explain the Hydrotreating process with a neat sketch of a process flow diagram. Indicate the feed material, operating conditions, and typical products obtained of the process (4)

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