

رقم الطالب:

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ملاحظات: الرجاء تسليم ورقة الامتحان مع كراسة الاجابة

Question 1: (20 Points).

A. Answer the following:

- 1) In a flow chart scheme, explain the process of reservoir simulation.
- 2) On what basis are numerical reservoir simulator classified? Clarify.
- 3) List the data needed for a black oil simulator. Give one example for each type.
- 4) Explain how numerical simulators can be abused?

B. Throughout the current term, you've been exposed and familiarized with the IFO numerical simulator, answer the following:

- 1) What type of simulator is this according to your classification in part A(2)?
- 2) Are there any uncertainty associated with IFO output? Justify if there's any
- 3) What are the limitations of the IFO reservoir simulator if there's any?
- 4) Can you use IFO to simulate a steam injection case? Why or why not.

Question 2: (15 points).

Given below is the material balance equation for oil and gas reservoirs:

$$F = N(E_o + mE_g + E_{fw}) + W_e$$

$$F = G(E_g + E_{fw}) + W_e$$

For each type of reservoir and using the equation of a straight line method Explain how to calculate the Initial oil/gas in place in case:

- 1) There's a water drive is associated.
- 2) There's NO water drive is associated.

Question 3: (10 Points)

- A. How can a reservoir management plan be implemented?
- B. Integration of geoscience and engineering depends on what points.
- C. What does stochastic modeling of geological data mean? sHow does that help reservoir management?

Question 4: (15 points).

- A. List the different methods used to assess reservoir performance.
- B. List all the factors which influence reservoir performance.
- C. On a **GOR VS PRESSURE** graph, show the characteristics of each the following drive mechanisms:
 - i. Water Drive
 - ii. Solution gas drive
 - iii. Gas Cap drive