UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

SECOND SEMESTER EXAMINATIONS, MAY 2018

COURSE NO: PE 376

COURSE NAME: FUNDAMENTALS OF ENHANCED OIL RECOVERY

CLASS: PE III TIME: 3 HRS

Name: _____ Index Number: _____

Begin each question from a fresh page. Number and space out sub-questions accordingly. Clearly written and neatly presented answers are encouraged.

ANSWER THREE (3) QUESTIONS (60 Marks)

QUESTION 1

a. What is the key objective of Enhanced oil recovery (EOR) methods implementation in the oil and gas industry? Indicate and concisely explain four EOR profitability factors. (9)

b. EOR methods and operations entail huge capital, as a Petroleum Engineer in charge of the Production unit of your company, how will you convince management to venture into EOR operations for productivity enhancement and profitability? (6)

c. What is the purpose or the usefulness of the screening criteria? (1)

d. During the second stage of EOR implementation process, the selected process undergoes economic evaluation. As a Petroleum Engineer, what are some of the necessary data that can be used for the economic analyses? (4)

QUESTION 2

a. What are chemical EOR process? Mention the three categories of the chemical process and for each of the process, mention briefly their purpose in oil recovery operations (7)

b. Mention three key objectives of enhance oil recovery (EOR) methods. (3)

c. What are some of the challenges/problems that can be associated with steam flood injection recovery method? (5)

d. Briefly explain 4 factors to consider when venturing into EOR operation. (4)

e. What is the key difference between dispersed and external gas injection methods in terms of position of injection wells? (1)

QUESTION 3

a. List four factors that help to determine/achieve first contact miscibility. (2)

b. Briefly distinguish between miscible and immiscible displacement processes. (2)

c. Management of steam flood project involves 3 aspects, mention them and briefly explain what each entails. (9)

d. Explain what an Improved Oil Recovery (IOR) refer to and list out the four main division processes with 2 examples each? (7)

QUESTION 4

a. Explain concisely the following: (i) Vaporising gas drive (ii) Condensing gas drive as types of multiple contact miscibility displacements and give examples of fluids used under each type. (6)

b. Describe the water–alternating–gas (WAG) injection process. Give 4 benefits of the WAG process. (6)

c. With the aid of a diagram, explain the steps involved in cyclic steam stimulation (CSS) method and mention 3 limitations to its success. (8)