



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF PURE & APPLIED SCIENCES**  
**2023 2 EXAMINATIONS**

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**COURSE CODE: CHM 311**

**CREDIT: 2 Units**

**INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions**

**COURSE TITLE: Petroleum Chemistry**

**TIME ALLOWED: 2 Hours**

**QUESTION ONE**

- a) Define Crude oil (3 Marks)
- b) List and give brief explanation on three types of kerogens (6 marks)
- c) Differentiate between Natural gas and biogas (3 marks)
- d) Enumerate on the completion process of an oil well (5 marks)
- e) Mention 5 uses of Natural gas (5 marks)
- f) What is Stratigraphic Traps (3 marks)

**QUESTION TWO**

- a) Describe in detail the process of formation of petroleum (7.5 marks)
- b) How do Organic Materials contributes to the generation of petroleum (7.5 marks)

**QUESTION THREE**

- a) Accumulation and preservation of undegraded organic matter are prerequisites for the existence of petroleum, explain (9 marks)
- b) Write short note on the two classes of sulphur compounds present in crude oil (6 marks)

**QUESTION FOUR**

- a) Analyse the process of transportation and storage of Natural gas (8 marks)
- b) Give the full meaning of STOOIP and define Oil in Place (3 marks)
- c) Underline the basic knowledge needed for Accurate calculation of the value of STOOIP (4 marks)

**QUESTION FIVE**

- a) Give two examples each of the two types of sulphur compounds (2 marks)
- b) Sour Crude increases cost of production in petroleum industry, explain (5 marks)
- c) Mention the metals present in crude oil and explain how their presence affect crude oil industry (8 marks)



- 3a. Write down the four (4) steps involved in the execution of rule Engine? *(4 marks)*
- b. In the context of object oriented programming, name six (6) postulates of inheritance in Frame- Based experts. *(6 marks)*
- c. Explain what this expert system characteristic signifies: **“Make logical inferences based on knowledge stored.”** *(5 marks)*

#### QUESTION 4

- 4a. Expert systems are now in commercial and research use in a number of fields. State the fields. *(9 marks)*
- b. Describe the method a Mycin operates. *(6 marks)*.

#### QUESTION 5

- 5a. What does the sensor stage in vision of a Mycin do? *(3 marks)*
- b. Enumerate extensively the components of Knowledge Engineering Environment (KEE) system. *(7 marks)*
- c. Draw the components of MYCIN system. *(5 marks)*

#### Question 4

Mr. Oloruntoba, a returnee from the Eastern Europe, approaches you for the quest of establishing a company whose shares will be sold to interested investors.

- a) Describe briefly the type of company Mr. Oloruntoba intends to form. **3 marks**
- b) Clarify the characteristics of a company to be floated by Mr. Oloruntoba. **12 marks**

#### Question 5

- a) Quotex Nigeria Ltd has the following information from its operations.

Earnings before interest and taxes N4,500,000  
The company has 5% debenture of N2,500,000 in its operations and it is in 25% tax bracket.  
Calculate the *Times Interest Earned*. **(7.5 marks)**

- b) Assuming you are the management consultant who has been approached to prepare the *Letter of Intent* for a proposed merger, describe briefly any five (5) relevant issues it will attempt to clarify. **(7.5 marks)**