



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja**  
**FACULTY OF SCIENCES**  
**COMPUTER SCIENCE DEPARTMENT**  
**2021\_1 EXAMINATIONS**

**CIT 445** – Principles & Techniques of Compilers.

**Credit:** 3 units

**TIME ALLOWED:** 2½ Hours

**INSTRUCTION:** Answer Question 1 and any other FOUR (4) Questions

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| Q1a. Define a Parser   | (3 Marks)  |
| b. Mention four (4) basic types of grammar                           | (4 Marks)  |
| c. Explain the Chomsky Hierarchy                                     | (3 Marks)  |
| d. What is Compiler?   | (3 Marks)  |
| e. Explain the concept of Code Optimization                          | (4 Marks)  |
| f. Describe the concept of Transition Diagram (TD)                   | (3 Marks)  |
| g. Explain Bottom-Up Parsing Technique                               | (2 Marks)  |
| Total Marks  | (22 Marks) |
| Q2a. Briefly Discuss Semantic Analysis                               | (3 Marks)  |
| b. Discuss with example, the Static Allocation                       | (5 Marks)  |
| c. What is Dead Code Elimination?                                    | (2 Marks)  |
| d. Define the compiler Back-end                                      | (2 Marks)  |
| Total Marks  | (12 Marks) |
| Q3a. Describe the Compiler Architecture?                             | (4 Marks)  |
| b. Why do you need Lexical Analyzer?                                 | (4 Marks)  |
| c. With examples, explain the term Attribute?                        | (4 Marks)  |
| Total Marks  | (12 Marks) |
| Q4a. What are the challenges involve in developing compilers?        | (6 Marks)  |
| b. Describe the concept of Intermediate Representation               | (6 Marks)  |
| Total Marks  | (12 Marks) |
| Q5a. With suitable example, explain the concept of Augmented Grammar | (4 Marks)  |
| b. How does Regular Expressions (Res) works?                         | (4 Marks)  |
| c. What are the ways of constructing lexical analyzer?               | (4 Marks)  |
| Total Marks  | (12 Marks) |
| Q6a. Demonstrate the concept of Context-Free Grammar                 | (8 Marks)  |
| b. With example, explain the GOTO Function                           | (4 Marks)  |
| Total Marks  | (12 Marks) |