NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE

Course Code: CIT 445 ***Time:*** 2½ hrs

Course Title: Principles & Techniques of Compilers Marking Scheme

***Course Credit Unit*:** 3

Instruction: Answer any five (5) questions

1a) Define formal Grammar. ***(3 marks)***
b) List and describe the four basic types of grammars in the field of Computer Science ***(11 marks)***

2a) Enumerate the uses of formal languages ***(3 marks)***
b) Enumerate the knowledge needed to build a compiler ***(5 marks)***
c) State any six qualities of a compiler (6 marks)

3a) It is customary to partition the compilation process into a series of sub-process called phases. What do you understand by the term "phase"? ***(2 marks)***
b) With the aid of a suitable diagram, clearly state the use of T-diagrams ***(3 marks)***
c) List the steps to implement Lex ***(5 marks)***

4a) Explain the process to create a lexical processor with Lex (***6 marks)***
b) Briefly describe a "parser". (***4 marks)***
c) State the roles of the parser (***4 marks)***

5a) State the need and constituents of a context-free Grammar (CFG) (***5 marks)***
b) How are the following represented? (***3 marks)***
(i) Grammar symbols (ii) strings of terminals (iii) productions
c) Enumerate the functions performed by the lexical analyser) ***(4 marks)***

d) State the characteristics of Bottom-up parsing. ***(2 marks)***

6a) Write short notes on the following:

(i) Operator precedence parser ***(2 marks)***

(ii) Operator Grammar ***(2 marks)***

(iii) Operator precedence Grammar ***(2 marks)***

b) State the operator precedence parser algorithm ***(8 marks)***

7a) Consider the grammar G below:

G: E → TE'
E' → -TE'/ε
T → FT'
T' → ^FT'/ε
F → (E) /*a*

a) Construct a parsing table for *G*

b) Determine if the sentence *a*-*a*^*a* can be formed from G using the parsing table constructed in (a) above