NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja
FACULTY OF SCIENCES
COMPUTER SCIENCE DEPARTMENT
2021_2 EXAMINATIONS

CIT 445 – Principles & Techniques of Compilers**.** **Credit:** 3 units
TIME ALLOWED: 2½ Hours
INSTRUCTION: Answer Question 1 and any other FOUR (4) Questions

1a) Outline three (3) typical questions asked about formalisms. (3mks)
1b) Suppose L_1 and L_2 are languages over some common alphabet; state two (2) standard operations that can be performed on the languages. (4mks)
1c) Identify three (3) types of Intermediate Representation (3mks)
1d) Why Do We Need Translators? (3mks)
1e) Outline the operations of the shift-reduce parser (4mks)
1f) Define finite automata. (3mks)
1g) Illustrate two properties entailed in using an intermediate language representation. (2mks)

2a) Examine the context-free grammar G with the productions
E → E + E | E * E | (E) | id
Generate possible leftmost derivations for id + id * id (10mks)
2b) Mention the two (2) ways of resolving collision ? (2mks)

3a) Consider the context-free grammar G with the productions
E → E + T | T
T → T * F | F
F → (E) | id

Generate the following:
i) Terminal symbols (3mks)
ii) Nonterminal symbols (3mks)
iii) Start symbol. (2mks)
3b) Outline the algorithm for constructing precedence functions (4mks)

4a) List and explain the components of the structure of a compiler(8mks)
4b) Identify the attributes of symbol table (4 mks)

5a) C onstruct the Operator precedence parsing algorithm (7mks)
5b) Explain the need for lexical analyser. (5mks)

6a) Suppose we have a Grammar G:

E → E + T
E → T
T → T * F
T → F
F → (E)
F → a

Find the left parse of the sentence a* (a+a) (9mks)
6b) What is Type-3: Regular Grammars (3mks)