

**LAGOS CITY POLYTECHNIC, IKEJA**  
**SCHOOL OF ENGINEERING AND APPLIED SCIENCE**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**2013/2014 FIRST SEMESTER EXAMINATION**

<b>COURSE TITLE:</b>	COMPILER CONSTRUCTION	<b>NO OF QUESTIONS :</b>	7
<b>COURSE CODE:</b>	COM 414	<b>TIME ALLOWED:</b>	2½ HRS
<b>FOR WHOM:</b>	HND YR II	<b>CS</b>	<b>FT EXAMINER:</b>
<b>NO OF STUDENT:</b>			<b>INSTRUCTIONS: ANSWER</b>

**QUES. 1 AND**

- |    |     | ANY   | OTHER                                | FOUR |
|----|-----|---|--------------------------------------|------|
| 1. | (a) | Chronicle   | he evolution of programming language |      |
|    | (b) | Identify and discuss the existing programming language equivalents.   |                                      |      |
|    | (c) | Illustrate your understanding of how the program syntax contrasts to program semantics.   |                                      |      |
| 2. | (a) | Critically contrast the following three elements used in translation-compiler, assembler, and interpreter.  |                                      |      |
|    | (b) | Identify their virtues and otherwise. Give the deliverable in each instance.  |                                      |      |
|    | (c) | Parse the following expression:<br>$y = v/t*q + j*p$ . Produce the corresponding AST of the parse tree.   |                                      |      |
| 3. | (a) | What informs that a program is a program? Be as explicit and convincing as possible.  |                                      |      |
|    | (b) | Given the grammar $G = (V, T, P, S)$ where<br>$V = \{S\}$ , $T = \{a, b\}$ , $P = \{S \rightarrow SAb, A \rightarrow aA, A \rightarrow a, S \rightarrow ab, b \rightarrow E\}$ .<br>Generate the languages:<br>aabb, abb, aaabbbbaaa.   |                                      |      |
| 4. | (a) | Discuss exhaustively, the implementation of the Traditional Three-Pass Compiler. Corroborate your answer with adequate diagram(s).  |                                      |      |
|    | (b) | Narrate your understanding of the Parse tree and Syntax tree with commensurate diagrams.  |                                      |      |
|    | (c) | Explain the roles of the Symbols Table and Error Handler.   |                                      |      |
| 5. | (a) | Define these terms: languages, grammars, productions, alphabet, non-terminals. Explain the structure below:<br>$\langle \text{sentence} \rangle = \langle \text{subject} \rangle \langle \text{predicate} \rangle$<br>Using the above structure/formula and given these two further formulae:<br>$\langle \text{subject} \rangle = \text{Johnson/Martins}$<br>$\langle \text{predicate} \rangle = \text{runs/sings}$ ,<br>define the possible sentences |                                      |      |
|    | (b) | What is an ambiguous grammar? Distinguish an ambiguous sentence from an ambiguous sentence.   |                                      |      |
|    | (c) | What is regular language?   |                                      |      |
| 6. | (a) | What is a recognizer? Explain how it works  |                                      |      |
|    | (b) | What is loop re-entrant/invariant? Implement a simple scenario of it.   |                                      |      |
| 7. | (a) | Define Finite Automaton. Distinguish between Deterministic Finite Automaton (DFA) and Non-deterministic Finite Automaton (NFA) with appropriate diagrams  |                                      |      |
|    | (b) | Describe Context Free Grammars (CFG) (c) Describe Context Sensitive Grammars (CSG)  |                                      |      |

