TECHNICAL ITY OF KENYA
School of Computin rmation Technologies
BACHELOR OF TECHNOLC FORMATION TECHNOLOGY

ECII 3207: COMPILER DESIGN AND CONSTRUCTION

CAT 2 -20th September 2022

1. Consider a language whose high level definition is as follows:

stmt→<keyword><identifier><operator><constant> (an example valid statement is: ***int anID1 = 9***)

Keyword → **int**, **boolean**, **load**
Operator → **+** , **-** , ***** , **/** , **=**
Constant →Any digit from **0** to **9**
Identifier →Any valid variable name that can be generated from: [a-z] [[A-Z] | [a-z] | [0-9]]^4

   a) Write pseudocode to check for a valid identifier **[3 Marks]**
   b) Write pseudocode to check for a valid statement **[3 Marks]**
   c) Implement a checker such that given a statement, your program output is either valid or invalid **[10 Marks]**

2. Compare and contrast: i) Recursive Descent parsing ii) Top-Down parsing iii) Predictive parsing **[6 Marks]**
3. Construct a recursive-descent parser, starting with the grammar: **S -> + SS | -SS | a** **[6 Marks]**
4. Given some form of computation for which the expression 8+6*3+9-2 yields 140, you are required to:
   a. draw the parse tree, whose yield results in the value of the expression being 140**. [4 Marks]**
   b. Give example production rules that could guide the parse tree you have generated using the following symbols: expr, +, *, - and digits 0 to 9 **[4 Marks]**
5. What is Syntax directed translation? Describe the two concepts associated with syntax directed translation **[5 Marks]**
6. In designing (or re-designing) a new compiler, what are 4 considerations that one must deal with? **[4Marks]**

Take away CAT – Due Thursday 22nd September 2022 at 9:00AM

Submit to: salesio.kiura@tukenya.ac.ke

make sure the subject line is clear in the submission email!