CHUKA  UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COMP 400: PROGRAMING LANGUAGE DESIGN

STREAMS: BSC (COMPUTER SCIENCE) **TIME: 2 HOURS**

DAY/DATE: MONDAY 10/12/2018 **11.30 A.M. – 1.30 P.M.**

CANDIDATE INSTRUCTIONS

Question one (Compulsory): 30 Marks

a. Every variable is created (or allocated) at some definite time and destroyed or de-allocated at some later time. This interval period can be referred to as lifetime. Classify variables according to their lifetimes. [4 marks]

b. Explain static semantics. [4 marks]

c. Each and every programming language is an artifact and to be worthy its name, must satisfy certain fundamental requirements. Discuss. [4 marks]

d. All programming languages have Syntax, semantics and pragmatics. Explain these concepts and highlight why natural languages lack pragmatics. [6 marks]

e. Describe what context-free grammars are and what they are used for? [4 marks]

f. In Reliability, explain what programmers mean by overall simplicity [4 marks]

g. Explain any four criteria for evaluating programming languages [4 marks]

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SECTION B: [Answer any two questions from this section]

QUESTION TWO:

a. Discuss the difference between Type checking and type inference [4 marks]

b. Discuss various challenges encountered by interpreted languages [8 marks]

c. Differentiate static binding from dynamic binding [4 marks]

d. Use java code to demonstrate the difference in Call-by-value versus call by reference [4 marks]

QUESTION THREE (20 MARKS)

a. Discuss the type of intermediate code which is produced by Java compiler. [4 marks]

b. Discuss the type of compilation that Java interpreters perform [4 marks]

c. Discuss two types of languages that use preprocessors and highlight the application areas. [6 marks]

d. Write a procedure and a call to it in block-structured pseudocode such that the execution of the procedure under pass-by-reference and under pass-by-value/result yields different outcomes. Justify your answer. [6 marks]

QUESTION FOUR (20 MARKS)

Discuss programming languages best suited for the following domains:

- *Scientific*
- *Business*
- *AI*
- *Web*
- *Gaming* *each 4mks x5 = 20mks*

QUESTION 5 (20 MARKS)

(a). ALGOL60 influenced numerous successor languages so strongly that they are collectively called ALGOL-like languages. Explain any five such languages and their application areas. [10 points]

(b). Discuss the advantages and inconvenient of dynamically-typed variables. [10 points]
