



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 301: COMPILER DESIGN

DATE: 22/3/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS:

Answer question ONE and any other TWO questions

QUESTION ONE (30 MARKS)

- a) Explain the various compiler construction tools. (2 marks)
- b) Explain the operations on languages. (2 marks)
- c) Explain the benefits of intermediate code generation. (2 marks)
- d) What is a DAG? Explain its applications. (2 marks)
- e) Define peephole optimization and explain the characteristics in compiler and construction. (4 marks)
- f) Differentiate between machine dependent and machine independent optimization. (2 marks)
- g) Suggest a suitable approach for computing hash function. (2 marks)
- h) Explain a context free grammar. (2 marks)
- i) Explain various methods of implementing three address statements. (2 marks)
- j) Using a diagram, discuss the Language Processing System in a compiler design. (6 marks)
- k) Explain the two divisions of phases based on the way they compile. (4 marks)

QUESTION TWO (20 MARKS)

- a) Discuss the phases of a compiler in compiler design. (10 marks)
- b) Discuss the role of semantic analysis in compiler design and construction. (5 marks)
- c) Discuss the role of the run-time environment phase in compiler design and construction. (5 marks)

QUESTION THREE (20 MARKS)

- a) Discuss the role of Lexical Analysis phase in compiler design and construction. (6 marks)
- b) Discuss the role of regular expressions in compiler design and construction. (7 marks)
- c) Discuss the role of finite automata in compiler design and construction. (7 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss the role of syntax analysis in compiler design and construction in relation to the following: (12 marks)
 - i. Context-Free Grammar
 - ii. Syntax Analyzers
 - iii. Derivation
 - iv. Parse Tree
 - v. Ambiguity
 - vi. Precedence and Associativity
- b) Discuss the four error recovery strategies in compiler design and construction. (8 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss the two types of parsing in compiler design and construction. (6 marks)
- b) Discuss the role of symbol table in compiler design and construction. (7 marks)
- c) Discuss the role intermediate code generation in compiler design and construction. (7 marks)