Mid-West University
Examinations Management Office
End Semester Examinations 2081

Bachelor level/ B.Sc / CSIT 5th Semester

Time: 3 hours

Subject: **Compiler Design (COM454)**

Full Marks: 60
Pass Marks: 30

Candidates are required to give their answer in their own words as far as Practicable. The figures in the margin indicate full marks.

Group A

Very short answer questions attempt *all* the questions.   [8x2 = 16]

1. What do you mean by Multi Pass Compiler? Illustrate with example.
2. Explain the purpose of lexical analysis in a compiler.
3. List the types of errors detected during the semantic analysis phase.
4. Explain the use of finite automata in the design of a lexical analyzer.
5. Explain recursive descent parsing.
6. Generate 3 address code for the statement: if a>b then x =y +z.
7. List the major issues in code generation.
8. Define constant folding optimization with an example.

Group B

Short answer questions. Attempt *any five* questions.   [5x4 = 20]

9. Briefly describe the differences between a top-down parser and a bottom-up parser.
10. Construct a DFA for the regular expression (0+1)*01
11. Compute first and follow of following grammar:

    $E \rightarrow TE'$

    $E' \rightarrow +TE' | \varepsilon$

    $T \rightarrow FT'$

    $T' \rightarrow *FT' | \varepsilon$

    $F \rightarrow (E) | id$

12. Explain the concept of quadruples and triples for intermediate code representation with examples.
13. Explain inherited and synthesized attributes with an example.
14. Discuss the importance of code optimization in the compiler and list its types.

Group C

Long answer questions. Attempt *any three* questions.   [3x8 = 24]

15. Explain phases of compiler with neat and labeled diagram. Illustrate compilation process for the statement: *position = initial + rate * 60*
16. Consider the following grammar and construct canonical SLR parsing table.

    $S \rightarrow L = R | R$

    $L \rightarrow * R | id$

    $R \rightarrow L$

17. What are the main objectives of the semantic analysis phase? Explain three address code generation from do while loop with example.
18. Explain in detail the code generation process in compilers. Write a simple algorithm for generating target code from three address code.

The End