

MCA
(SEM IV) THEORY EXAMINATION 2018-19
COMPILER DESIGN

Time: 3 Hours**Total Marks: 70**

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 7 = 14

- a. What do you mean by Finite Automata?
- b. Explain three address codes with example.
- c. What do you mean by Control flow?
- d. Explain the term Token, Pattern, Lexemes.
- e. Discuss the term ambiguity.
- f. What do you mean by error handler?
- g. Draw a flow chart to find finite automata from regular expression

SECTION B

2. Attempt any three of the following: 7 x 3 = 21

- a. What is the difference between static and dynamic memory allocation? How static scope rules are defined using stack?
- b. Explain about basic parsing techniques. What is top down parsing? Explain in detail.
- c. Define the following:
 - i. Regular expression
 - ii. Regular grammar
 - iii. Context free grammar
- d. What do you mean by left factoring? Explain with the help of example, how left factoring can be avoided.
- e. Consider the following:
 $E \rightarrow T + E / T$
 $T \rightarrow V * T / V$
 $V \rightarrow id$

Write down the procedures for the non-terminals of the grammar to make a recursive descent parser.

SECTION C

3. Attempt any one part of the following: 7 x 1 = 7

- (a) What is the use of run time storage administrator? What is the difference between static and dynamic allocation?
- (b) Describe the various code optimization techniques in detail.

4. Attempt any one part of the following: 7 x 1 = 7

- (a) What is symbol table? Explain in detail. Explain the use of symbol table.
- (b) What is L.R. Parser? How it is different from SLR? Construct LALR table for
 $S \rightarrow S$
 $S \rightarrow aAd/bBd/aBc/bAc$

5. Attempt any one part of the following: 7 x 1 = 7

- (a) Explain any two of the following in detail:
 - i. Lexical phase errors

- ii. Syntactic phase errors
- (b) Discuss the role of syntax directed translation scheme.
6. **Attempt any *one* part of the following:** **7 x 1 = 7**
- (a) What do you mean by DAG? Explain the algorithm for constructing a DAG with the help of example.
- (b) How registers are allocated in code generation? Differentiate among source code, intermediate code and object code
7. **Attempt any two parts of the following:** **3.5x2 = 7**
- (a) What is translator? Classify the translator.
- (b) What is Parsing? Explain its types.
- (c) Consider the following grammar:
- $S \rightarrow S = R$
 $S \rightarrow R$
 $L \rightarrow \cdot R$
 $L \rightarrow id$
 $R \rightarrow L$
- Write the algorithm for FOLLOW. And find the FIRST and FOLLOW for the given grammar.