

(64/A-82)

SEMIESTER No. _____

Total No. of pages : 2

SARDAR PATEL UNIVERSITY
M.C.A.(IV Semester) Examination
PS04CMCA22 Compiler Design
8th April, 2019. Monday

Time : 2:00 PM to 5:00 PM

Total Marks : 70

1. Select most appropriate option for each of the following questions : 8

- (i) Epsilon-transitions are permitted in
(A) a DFA (B) a TFA (C) an NFA (D) None of these.
- (ii) A grammar that produces more than one parse trees for the same sentence is said to be _____.
(A) an ambiguous grammar (B) a left factored grammar
(C) a left recursive grammar (D) None of these.
- (iii) Which of the following is a top-down parser ?
(A) Handle pruning parser (B) Predictive parser
(C) Operator precedence parser (D) None of these.
- (iv) Parsing table of which parser contains two parts called Action and Goto ?
(A) LR (B) Predictive (C) Operator precedence (D) None of these.
- (v) If S is a start symbol of the given grammar, FOLLOW(S) always contains _____.
(A) # (B) \$ (C) epsilon (D) None of these.
- (vi) A language denoted by a regular expression is known as a
(A) regular set (B) regular definition
(C) regular equation (D) None of these.
- (vii) Dead code elimination technique is used in the _____ phase of a compiler.
(A) Lexical Analysis (B) Syntax Analysis
(C) Intermediate Code Generation (D) Code Optimization.
- (viii) Which of the following is used as a kind of intermediate representation?
(A) regular expression (B) infix notation
(C) three-address code (D) None of these.

2. Answer the following questions in brief (ANY SEVEN) : 14

- (i) Define : a **Context Free Grammar**.
(ii) What are the main advantages of **intermediate code generation** ?
(iii) What is **left factoring** ? Give an illustration.
(iv) List the **cousins** of a compiler.
(v) Explain the role of a **syntax analyzer**.

(P. T. O.)

- (vi) Explain the meaning of a *leftmost derivation* taking an example.
- (vii) Define a **regular expression**. Give at least two examples.
- (viii) Write the meaning of each symbol in **LR(k)**.
- (ix) Distinguish between a **pass** and a **phase** of a compiler.
- 3.(A) What is a **compiler** ? Draw a diagram showing various *phases of a compiler*. Explain the significance and the functions performed by each phase of a compiler in brief. 6
- (B) What is the role of a **lexical analyzer** ? Describe the *two-buffer technique* for input buffering. Write the algorithm for advancing a forward pointer using sentinels. 6
- OR**
- (B) Explain the technique to eliminate **left recursion** in a given grammar. 6
- 4.(A) Construct an NFA for the following regular expression using the *Thompson's construction* method. 6
- $(a | bb)^* ccc$
- (B) Distinguish between a **DFA** and an **NFA**. 6
- OR**
- (B) Explain : stack implementation of **Shift-Reduce Parsers**. 6
- 5.(A) Show the model of a non-recursive *predictive parser*. Write the algorithm for non-recursive predictive parsing. 6
- (B) Which information is entered into a *symbol table* ? List the required capabilities of a symbol table. Explain how a symbol table can be implemented using a hash table. 6
- OR**
- (B) Explain the *operator-precedence parsing* technique in brief, describing the method to delimit a handle of a right-sentential form. 6
- 6.(A) What is a *three-address code* ? What are the different ways of implementing three-address statements ? Explain any one in detail. 6
- (B) List the principal sources of optimization. Describe the *loop optimization technique* taking a suitable example. 6
- OR**
- (B) List the *major issues* in the design of a **code generator**. Write the *code generation* algorithm. 6

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