2019
COMPILER DESIGN

CS 604A

TIME ALLOTTED: 3 Hrs. **FULL MARKS : 70**

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

GROUP – A
(Multiple Choice Type Questions)

1. Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

(i) Which of the following derivations does a top-down parser use while parsing an input string?

a) Leftmost derivation

b) Leftmost derivation in reverse

c) Rightmost derivation,

d) Rightmost derivation in reverse

(ii) Parse tree is generated in the phase of
a) Syntax Analysis b) Semantic Analysis
c) Code Optimization d) Intermediate Code Generation.

(iii) Compiler translates the source code to
a) Executable code b) Machine code
c) Binary code d) Both b) and c)

(iv) Grammars that can be translated to DFAs:
a) Left linear grammar b) Right linear grammar
c) Generic grammar d) All of these

(v) Which of the following groups is/are token together into semantic structures?

a) Syntax analyzer b) Intermediate code generation

c) Lexical analyzer d) Semantic analyzer

(vi) If x is a terminal, then FIRST(x) will be ……………
a) (x) b) {x} c) {X} d) none of these

(vii) What are the various kinds of intermediate representations for intermediate code generation?
a) Syntax trees b) Postfix notation c) Three address code d) All of the above

(viii) Grammar of the programming is checked at _______ phase of compiler.

a) Semantic analysis b) Syntax analysis

c) Code optimization d) Code generation

(ix) _________ is a process of finding a parse tree for a string of tokens.

a) Parsing b) Analysing

c) Recognizing d) Tokenizing

(x) Lexical analysis is about breaking a sequence of characters into

a) Groups b) Packets c) Lines d) Tokens

(xi) Compiler can check ________ error.

a) Logical b) Syntax c) Content d) Both A and B same

(xii) Which one is faster?

a) Compiler b) Interpreter c) Linker d) Assembler

GROUP – B

(Short Answer Type Questions)

(Answer any *three* of the following) **3 x 5 = 15**

2. a) Define a compiler. **2**

b) Define tokens, Patterns and lexemes. **3**

3. What is ambiguous grammar? Eliminate ambiguities for the grammar: **5**

E ->E + E|E*E|(E)|id.

4. What is annotated parse tree? **2**

What do you mean by terminal table and literal table? **3**

5. What is recursive descent parsing? **1**

Describe the drawbacks of recursive descent parsing for generating the string 'abc' from the grammar :

S -> aBc , B -> bc | b **4**

6. Translate the expression : **5**

(a – b) * (c + d) + (a + c + d) into

i) quadruples

ii) triples

iii) indirect triples

GROUP – C

(Long Answer Type Questions)

(Answer any *three* of the following) **3 x 15 = 45**

7. a) Explain stages of compilation with diagram? **6**

Consider the following statement

X=a+b*c

b) Explain what will be the output at each stages of compilation. **6**

c) Differentiate between: Compiler and Interpreter. **3**

8. a) Describe LR parsing with block diagram. **4**

b) What are the main advantages of LR parsing? **3**

c) Construct SLR parsing table for the grammar given below : **8**

S -> Cb , C -> bC / d

9. a) Construct DFA directly from [Not by generating NFA] the regular expression **7**

L = (a | b)*ab

b) What are the main contributions of Syntax Directed Translation in Compiler? **3**

c) Design a Dependency Graph and Direct Acyclic Graph for the string **5**

a + a * (b – c) + (b – c) * d

10. a) What do you mean by three address code? Give an example? **3**

b) Consider the following expression and represent it into quadruple, triple, indirect three address mode representation: x=(a+b)*(c+d)+(a+b+c) **6**

c) What is DAG? Construct DAG for the following basic block: **1**

d: = b+c **5**

e: = a+b

b: =b*c

a: = e-d.

11. Write short notes on the following **(any three)**: **3 x 5**

a) LEX and YAAC

b) Activation Record

c) Symbol Table

d) Peephole optimization

e) Nesting Depth Approach