

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2170701****Date: 15/11/2018****Subject Name: Compiler Design****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**MARKS**

- Q.1** (a) List the cousins of compiler and explain the role of any one of them. **03**  
 (b) Write a brief note on input buffering techniques. **04**  
 (c) Explain front end and back end of compiler in detail. **07**

- Q.2** (a) Define the following terms and give suitable example for it. **03**  
 1) Handle 2) Handle pruning 3) Left Factoring  
 (b) Explain all error recovery strategies used by parser. **04**  
 (c) Construct LL(1) parsing table for the following Grammar: **07**  
 $E \rightarrow E+T \mid T$   
 $T \rightarrow T * F \mid F$   
 $F \rightarrow (E) \mid a$

**OR**

- (c) Construct NFA for following regular expression using Thompson's notation and then convert it into DFA. **07**  
 $(a/b)^*abb\#$

- Q.3** (a) Define the following terms and give suitable example for it. **03**  
 1) Augmented Grammar 2) LR(0) Item 3) LR(1) Item  
 (b) Differentiate Top Down Parsing and Bottom up parsing **04**  
 (c) Construct SLR parsing table for the following grammar : **07**  
 $S \rightarrow (L)a$   
 $L \rightarrow L, S \mid S$

**OR**

- Q.3** (a) Give the difference between SLR and CLR Parser. **03**  
 (b) List the different conflicts that occur in Bottom up parsing and give examples for that. **04**  
 (c) Implement the following grammar using Recursive Descent Parser. **07**  
 $S \rightarrow Aa \mid bAc \mid bBa$   
 $A \rightarrow d$   
 $B \rightarrow d$

- Q.4** (a) What is Ambiguous Grammar? Describe with example. **03**  
 (b) Give the difference between synthesized attributes and inherited attributes **04**  
 (c) Construct CLR parsing table for the following grammar : **07**  
 $S \rightarrow AA$   
 $A \rightarrow aA \mid b$

**OR**

- Q.4** (a) List the different issues in code generation phase and describe any two issues. **03**  
 (b) Explain parameter passing techniques for procedure. **04**  
 (c) Explain Quadruple, triple and indirect triple with suitable example. **07**

- Q.5** (a) Draw syntax tree and DAG for the statement **03**  
 $x=(a+b)*(a+b+c)*(a+b+c+d)$   
(b) Explain dynamic memory allocation strategy. **04**  
(c) What is an activation record? Explain how they are used to access local and global variables. **07**

**OR**

- Q.5** (a) Write a note on stack allocation strategy. **03**  
(b) Give the translation scheme that converts infix to postfix expression for the following grammar and also generate the annotated parse tree for input string "id+id\*id" **04**  
 $E \rightarrow E+T \mid T$   
 $T \rightarrow T * F \mid F$   
 $F \rightarrow id$   
(c) Discuss various code optimization techniques with examples. **07**

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