Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2021

Subject Code:2170701 Date:03/08/2021

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)** What is the role of lexical analyzer? Justify your answer with example. **03**

(b) Briefly explain the role of linker and loader in language processing activity. **04**

(c) Discuss the various storage allocation strategies for compilers in detail. **07**

Q.2 **(a)** Define the following terms: **03**

(i) Context free grammar
(ii) Handle pruning
(iii) Symbol table

(b) What is recursive descent parsing? Design recursive descent parsing for the following grammar: **04**

S → aSa | aa

(c) Convert the following regular expression to DFA using subset construction method. **07**

((0|1)(0|1))*#

OR

(c) Construct the predictive parser for sentence (a, a) using the grammar: **07**

S → (L)|a
L → L,S|S

Check whether the given grammar is LL(1) or not?

Q.3 **(a)** Write CFG for the following languages: **03**

i. $\{a^m b^m : m>=n\}$
ii. generates strings having equal number of a's and b's over symbols {a,b}.

(b) Given the algorithm for computing precedence function. Consider the following OPG table matrix, compute precedence function. **04**

	a	(	)	;	$
a			>	>	>
(	<	<		<	
)			<	<	<
;	<	<	>	>	
$	<	<			

(c) Construct the SLR parsing table for the following grammar. **07**

S → AaAb
S→ BbBa

A→ ^
B→ ^

OR

Q.3	**(a)**	Explain the strategies used to recover from syntactic errors.	**03**
	(b)	Explain the algorithm to remove left recursion in context free grammar with example.	**04**
	(c)	Construct the LALR parsing table for the following grammar: S → AA A → aA|b	**07**
Q.4	**(a)**	Explain Activation record in detail.	**03**
	(b)	Translate the expression – (a+b)*(c+d)+(a+b+c) into 1. Quadruples 2. Triples 3. Indirect triples	**04**
	(c)	Consider the following grammar. Write syntax directed definition. Consider "char a, b, c" as the input sentence and draw augmented parse tree. Also determine evaluation order. S → T List T → integer/float/double/char List → List1, id List → id	**07**

OR

Q.4	**(a)**	List the different conflicts that occur in Bottom up parsing and give examples for that.	**03**
	(b)	Write a three address code for the following expression: a < b or c < d	**04**
	(c)	Give the translation scheme for converting the assignment statements into three address code. Assume suitable example for the same.	**07**
Q.5	**(a)**	What is DAG? Construct DAG for following expression: a + a * (b-c)+ (b–c)* d.	**03**
	(b)	Explain parameter passing techniques for procedure.	**04**
	(c)	Write Short notes on 1. Local and loop optimization 2. induction variable elimination	**07**

OR

Q.5	**(a)**	What is flow graph? Give suitable example.	**03**
	(b)	Discuss briefly about the Peephole optimization	**04**
	(c)	Explain the issues regarding code generation in compiler design with example.	**07**

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