Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (OLD) - EXAMINATION – SUMMER 2018

Subject Code:170701 **Date:08/05/2018**

Subject Name:Compiler Design

Time:02:30 PM to 05:00 PM **Total Marks: 70**

Instructions:

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

Q.1 **(a)** Define following terms: **07**

i. Compiler
ii. Interpreter
iii. Assembler
iv. Regular Expression
v. Token
vi. Lexeme
vii. Pattern

(b) How do the parser and scanner communicate? Explain with the block diagram communication between them. Also explain: What is input buffering? **07**

Q.2 **(a)** Construct DFA for following regular expression without constructing NFA and optimize the same. **07**

(a | ε)* a b (a | b)* #

(b) Discuss various Storage allocation strategies in detail. **07**

OR

(b) Explain various data structures used in symbol table management. **07**

Q.3 **(a)** Construct a SLR parsing table for following grammar. **07**

S -> aAb | bB
A -> Aa | ϵ
B -> Bb |ϵ

(b) Check whether the given grammar is LL (1) or not? **07**

S -> aAC | bB
A -> Abc | Abd | e
B -> f | g
C -> h |i

OR

Q.3 **(a)** Construct the LALR parsing table for the following grammar. **07**

S -> CC
C -> aC
C -> d

(b) Write a syntax directed definition for desk calculator. Justify whether this is an S-attributed definition or L-attributed definition. Using this definition draw annotated parse tree for 3*5+4n. **07**

Q.4 **(a)** What is intermediate code? Explain different types of intermediate code representations. Also discuss importance of intermediate code. **07**

(b) Explain activation tree, control stack, the Scope of Declaration and Bindings of Names. **07**

OR

Q.4 **(a)** Explain Operator precedence Parsing technique in detail. **07**

(b) Write down short note on Error – Recovery Strategies. **07**

Q.5 **(a)** i. Construct the DAG for the following basic block: **07**

d: = b * c
e: = a + b
b: = b * c
a: = e – d

ii. Describe issues in code generation process.

(b) Explain Peephole Optimization in detail. **07**

OR

Q.5 **(a)** Write Short notes on **07**

i. Local and loop optimization

ii. induction variable elimination

(b) Explain automatic generation of lexical analyzer and parser. **07**

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