Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 160706 Date: 09-12-2013

Subject Name: System Programming

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)** Write algorithm for operator precedence parsing and explain with example **07**

(b) Define the following terms. **07**

1) Handle 2) Program Relocation 3) literals 4) Forward Reference
5) pass 6) Frequency reduction 7) triples

Q.2 **(a)** Explain various data structures of Macro definition processing with example **07**

(b) State whether the following statements are true or false. Justify your answer. **07**

1) An interpreter is a language translator.
2) Knowledge of software engineering helps us to bridge the semantic gap
3) To make top-down parsing feasible, it is necessary to eliminate left-recursion.
4) Optimization seeks to improve the program rather than the algorithm used in a program.
5) When KPDTAB is empty, KPDTP set to '0'.
6) Constants and literals are two names having the same meaning.
7) Simple precedence grammar is a superset of Operator Precedence grammar.

OR

(b) 1) Compare Variant I and Variant II of intermediate code generation for assembler? **07**

2) Explain types of grammer.

Q.3 **(a)** Given the source program: **07**

```
        START   100
A       DS      3
L1      MOVER   AREG,B
        ADD     AREG,C
        MOVEM   AREG,D
        MOVER   BREG,='2'
        MOVER   CREG,='4'
D       EQU     A+1
L2      PRINT   D
        LTROG
                ='2'
                ='4'
        ORIGIN  A-1
C       DC      5
        ORIGIN  L2+3
        STOP
B       DC      '19'
        END     L1
                ='5'
```

1) Show the contents of symbol table at the end of pass I.
2) Explain the significance of EQU and ORIGIN statements in the program and explain how they are processed by the assembler.
3) Show the intermediate code generated from the program.

(b) Explain recursive descent parsing algorithm. **07**

OR

Q.3 **(a)** Given the source program: **07**

```
        START   200
X       DS      4
L1      MOVER   AREG,Y
        SUB     AREG,Z
        MOVEM   AREG,W
W       EQU     X+2
L2      PRINT   W
        ORIGIN  X-5
Z       DC      '9'
        ORIGIN  L2+1
        STOP
Y       DC      '7'
        END
```

1) Show the contents of symbol table at the end of pass I.
2) Explain the significance of EQU and ORIGIN statements in the program and explain how they are processed by the assembler.
3) Show the intermediate code generated from the program.

(b) Define Lexical and Semantic Expansion. Write a macro which takes A, B, C and D as parameters and calculates A*B+C*D in AREG. **07**

Q.4 **(a)** Explain the complete working of first pass of the double pass assembler along with the data structure used. **07**

(b) 1) Explain Memory allocation models **07**
2) Explain methods for accessing non local variables.

OR

Q.4 **(a)** Draw flow chart of "program linking" **07**

Q.4 **(b)** 1) Perform left-fectoring on the following grammar **07**

S = i E t S e S | i E t S | a
E = b

2) Show quadruple table for local optimization using value numbers

Stmt. No.	Stmt
14	g=25.2
15	x=z+2
16	h=x*y+d
:	……..
34	w=x*y

Q.5 **(a)** 1) Draw a DFA for the following Regular Expression. **07**
(a/b)* abb
2) Draw a flowchart of maintaining Table of Incomplete Instruction (TII) in assembler.

(b) Explain different code optimization techniques. **07**

OR

Q.5 **(a)** Write an algorithm for first pass of a linker. **07**

(b) 1) Explain functioning of interpreter. **07**
2) Explain object module of the program.

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