Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER–III • EXAMINATION – WINTER 2014

Subject Code: 630005 **Date: 05/01/2015**

Subject Name: System Software

Time:10:30 am - 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.**

Q.1 **(a)** Explain the following terms in brief: **07**

1. Language processor
2. Intermediate Representation
3. Quadruple
4. Screen Editor
5. Abstract Syntax Tree
6. Binding
7. Impure Interpreters

(b) List and explain in brief the fundamental steps used in program development. **07**

Q.2 **(a)** Write a note on different type of parameters used in macro giving suitable example. **07**

(b) Construct the data structures for the following macro expansion **07**

```
        MACRO
        CLR     &A, &B, &R=AREG
        LCL     &L
&L      SET     0
        MOVER   &R, ='0'
.SS     MOVEM   &R, &A+&L
 &L     SET     &L+1
        AIF     (&L NE B)   .SS
        MEND
```

OR

(b) Write algorithm for Macro Expansion. **07**

Q.3 **(a)** Explain the significance of OPTAB, SYMTAB, LITTAB in Pass I of the Assembler. **07**

(b) Explain the role of operator descriptor and register descriptor in code generation and also write code generation routine. **07**

OR

Q.3 **(a)** Write algorithm for Pass I of the Assembler. **07**

(b) Explain how local and non local variables are accessed in block structured languages with the help of static and dynamic pointers. **07**

Q.4 **(a)** Construct the parse table for the LL(1) parser for the following Grammar using FIRST and FOLLOW method **07**

S ::= AS'

S' ::= *AS' | Ɛ

A ::= BA'

A' ::= /BA | Ɛ

B ::= <int>

Validate the string |-<int> * <int> / <int>-| according to the given grammar.

(b) Write a short note on Global optimization. **07**

OR

Q.4 **(a)** For the given grammar, design operator precedence matrix. Verify the validity of the string |- <id> * <id> - <id> + <id>-| and show all the intermediate steps of operator precedence parsing using stack. **07**

A ::= C * A | C

C ::= B - C | B

B ::= D + B | D

D ::= <id>

(b) Write a note on how stacks, extended stack and heap are used as Allocation data structures. **07**

Q.5 **(a)** Define Binary program and explain the use of Header, Program, RELOCTAB, and LINKTAB components of Object module. **07**

(b) Discuss Absolute loaders, Compile and Go loaders with its advantages and disadvantages. **07**

OR

Q.5 **(a)** Draw the figure that shows the working of two pass linking loader and explain each of its components. **07**

(b) Draw object record formats of THEADR, LNAMES, SEGDEF and explain their usage. **07**

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