

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, LITAB 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**
 $S ::= AS'$
 $S' ::= *AS' \mid \epsilon$
 $A ::= BA'$
 $A' ::= /BA \mid \epsilon$
 $B ::= \langle \text{int} \rangle$
 Validate the string $|- \langle \text{int} \rangle * \langle \text{int} \rangle / \langle \text{int} \rangle -|$ 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 $|- \langle \text{id} \rangle * \langle \text{id} \rangle - \langle \text{id} \rangle + \langle \text{id} \rangle -|$ and show all the intermediate steps of operator precedence parsing using stack. **07**
 $A ::= C * A \mid C$
 $C ::= B - C \mid B$
 $B ::= D + B \mid D$
 $D ::= \langle \text{id} \rangle$
- (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**
