# GUJARAT TECHNOLOGICAL UNIVERSITY
### MCA. Sem-III  Regular Examination January  2011

**Subject code: 630005**              **Subject Name: System Software**

**Date:  07 /01 /2011**                              **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 difference between Derivation and Reduction by taking suitable example.   **07**

**(b)** Discuss the following terms.
- i.   Editors   **03**
- ii.  Debug Monitors   **04**

**Q.2** **(a)** Generate the parser table for an LL(1) parser for following Grammar using FIRST and FOLLOW technique.   **07**

$$E = T\ E'$$
$$E' = -\ T\ E'\ |\ \varepsilon$$
$$T = V\ T'$$
$$T' = /\ V\ T'\ |\ \varepsilon$$
$$V = <id>$$

And also give the sequence of prediction made by parser for the source string like $\vdash <id>\ /\ <id>\ -\ <id>\ \dashv$ .

**(b)** Why an Allocation Data Structure used? How the memory areas are allocated and deallocated by various types of allocation data structure.   **07**

**OR**

**(b)** How can you differentiate DFA with FSA? Build the DFA for regular expression (a|b)*bb(a|b)*.   **07**

**Q.3** **(a)** Explain ORIGIN, EQU and LTORG assembler directives in detail.   **07**

**(b)** What is an overall procedure for compilation of expression? Briefly explain the use of Operand Descriptors and Register Descriptors in expression compilation.   **07**

**OR**

**Q.3** **(a)** Discuss Pass I of the assembler in detail.   **07**

**(b)** Explain with example - The role of static and dynamic pointer for accessing local and nonlocal variable in block structured language.   **07**

**Q.4** **(a)** Write a short note on "Code Optimization".   **07**

**(b)** Construct all data structures for Macro given below   **07**

```
        MACRO
        MCA        &X , &Y , &REG = BREG
        AIF        (&Y  EQ  0 )        .ERR
        MOVER      &REG , &X
        DIV        &REG , &Y
.ERR    MEND
```

Also generate the statements for these two Macro call.
- i.    MCA  5 , 5 , REG = AREG
- ii.   MCA  2 , 0

**OR**

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**Q.4** **(a)** Explain the Algorithm for Macro Expansion. **07**

**(b)** Explain the procedure for expansion of Nested Macro calls in detail. **07**

**Q.5** **(a)** What is Program Relocation? Explain the use of EXTRN and ENTRY statements in linking. **07**

**(b)** What do you understand by Device Driver? What is the significance of init(), open(), intr(), and poll() entry points in Device Driver. **07**

**OR**

**Q.5** **(a)** What is the advantage of Overlay? How it works? Explain in detail. **07**

**(b)** Discuss different types of Device Driver by drawing suitable figure. **07**

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