Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER–III • EXAMINATION – SUMMER 2013

Subject Code: 630005 **Date: 22-05-2013**

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)** Answer the following: **07**

Define:

1. Language Processor
2. Binding
3. Scanning and Parsing
4. Expression tree
5. Format of quadruple
6. Linked time address
7. Grammar

(b) State true or false and justify your answer: **07**

a. Stack is used as an allocation data structure.
b. RD parser is a top-down parser.
c. Whenever a macro is called the macro code gets executed.
d. An object module is a binary program.
e. Derivation is same as bottom-up parsing.
f. LTORG is an imperative statement.
g. AGO falls under lexical substitution.

Q.2 **(a)**

1. Discuss the various types of assembly statements. **03**
2. Write a short note on Debug Monitors **04**

(b) Explain the various data structures used during Pass-I and Pass-II of an assembler. **07**

OR

(b) Write a short account on the front end and back end processing of a toy compiler. **07**

Q.3 **(a)** (i) What is a macro? Give the various types of parameters used in macro definition. **04**

(ii) Write a brief account on Expansion time variables. **03**

(b) What are device drivers? Give the detailed classification of device drivers. **07**

OR

Q.3 **(a)** For the given macro create the various data structures required for the macro call INCR A, 5, AREG **07**

```
MACRO
INCR      &MEM_VAL, &INCR_VAL, &REG
MOVER     &REG, &MEM_VAL
ADD       &REG, &INCR_VAL
MOVEM     &REG, &MEM_VAL
MEND
```

(b) Give the difference between character device drivers and block device drivers. Also list and explain any three entry points of character device drivers. **07**

Q.4 **(a)** (i) Explain Variant – I and Variant – II for IC generation **04**

(ii) What are overlays? **03**

(b) Consider the following expression: a + b * c ^ d / e. **07**

Construct the corresponding triple and quadruple format of the above expression.

OR

Q.4 **(a)** 1. Give differences for the following: **04**

a. Allocation data structures and Search data structures

b. Literals and Declare constant

2. Write a short note on extended stack model. **03**

Q.4 **(b)** Write a short note on code optimization **07**

Q.5 **(a)** Using the following LL(1) grammar show whether the following strings are valid or not: **07**

E ::= T*E'*

E' ::= -*T E'* | ε

T ::= V*T'*

T' ::= /*V T'* | ε

V ::= <*id*>

Input String:

1) <id> - <id> / <id>
2) <id> / <id> - <id>

(b) Write a short note on: **07**

a. Object Module

b. Self-locating programs

OR

Q.5 **(a)** Using the following grammar of RD Parser show whether the following strings are valid or not: **07**

E ::= T {+ T}*

T ::= V {* V}*

V ::= <id>

Input String:

1) <id> * <id> * <id>
2) <id> + <id> * <id> <id>

(b) Define the following: **07**

a. Public Definitions

b. External variables

c. Translated origin

d. Program relocation

e. Address sensitive instruction

f. Load time address

g. Absolute loader

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