Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2014

Subject code:1720202 **Date: 03-12-2014**

Subject Name: Design of Language Processors

Time: 02:30 pm - 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)** Consider the following code snippet in C: **07**

```
total=0;
for (j=0;j<15;j++)
total=total+ x[j]*x[j]+y[j] *y[j];
```

Generate the three address code for it.

(b) What do you understand by operator precedence parsing? Parse the following string giving the diagrammatic trace of the algorithm. **07**

1. $<id>_a + <id>_b * <id>_c$

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

E=TE'
E'=-TE' | ***€***
T=VT'
T' =/VT' | ***€***
V=<id>

Also give the sequence of prediction made by parser for the source string like

$|- <id>_a / <id>_b - <id>_c -|$

(b) Explain the criteria's used for classification of data structures in the Language Processors. Also explain the following : **07**

(i) Hash Table Management
(ii) Collision handling Methods

OR

(b) Construct a DFA for recognizing the identifiers, unsigned integers and unsigned real numbers with fractions. **07**

Q.3 **(a)** What is an address sensitive program? Explain the concept of Program Relocation in detail. **07**

(b) What are the Compiler Design issues? Explain in detail. **07**

OR

Q.3 **(a)** Explain the design of the Linker with an example. **07**

(b) What is a Loader? Explain how is linking and loading done in MS DOS. **07**

Q.4 **(a)** List and explain the different tables created and used by the macro preprocessor **07**

(b) Develop regular expressions for the following: **07**
1) Set of strings of 0's and 1's not containing 1101 as a substring.
2) Set of strings of a's and b's ending with abab.

OR

Q.4 **(a)** What are Nested Macros? Explain with an appropriate example. **07**
(b) Write the skeletal of the Parser which performs parsing without backtracking. **07**

Q.5 **(a)** Given the following program: **07**

```
        START    300
ID1     DS       5
L1      MOVER    AREG,D
        ADD      AREG,C
        SUB      AREG,C
        MOVEM    AREG,ID1
D       EQU      ID2
L2      PRINT    D
        ORIGIN   ID1-1
        STOP
ID2     DC
        END      L1
```

Show the contents of symbol table and intermediate code using variant 1 at the end of pass-I Assembling.

(b) If following grammar G is given : **07**

<Sentence> :: = <Noun Phrase><Verb Phrase>
<Noun Phrase> ::= <Article><Noun>
<Verb Phrase> ::= <Verb> <Noun Phrase>
<Article> = a | an | the
<Noun> = girl |Strawberry
<Verb> = ate

If the input string is "The girl ate a Strawberry" then perform reduction operation stepwise.

OR

Q.5 **(a)** Write Short Notes on : **05**
- Peephole optimization
- Type -3 grammar

(b) What is Operator Grammar? Explain. **02**
(c) List and explain the tasks performed by a two pass assembler and the syntax and the usage of Advance Assembler Directive. **07**

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