Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject code: 1720202 **Date: 18-06-2014**

Subject Name: Design of Language Processor

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)** List the tasks performed by each pass of a two pass assembler. Also explain following directives for an assembler: ASSUME, EQU, EXTERN, ORIGIN. **07**

(b) What is left factoring? Give example. Write unambiguous production rules for if then else construct. **07**

Q.2 **(a)** Construct a DFA for recognizing the identifiers, unsigned integers and unsigned real numbers with fractions. **07**

(b) Construct DFA without constructing NFA for following regular expression: (a | b) * (b | c) * a*# .Write production rules from constructed DFA. **07**

OR

(b) Write unambiguous production rules for arithmetic expression consisting of following operators: +, - (binary), - (unary), ( ), *, /, ^ (exponent). **07**

Q.3 **(a)** List different code improving transformations and explain any three of them. **07**

(b) 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.

OR

Q.3 **(a)** Construct a SLR parsing table for following grammar. **07**

$S \rightarrow xCy \mid xDy \mid xCz$

$C \rightarrow cS \mid d$

$D \rightarrow d$

(b) 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.

Q.4 **(a)** List and explain the tasks performed by a two pass assembler and the syntax and the usage of Advance Assembler Directive. **07**

(b) Write three address code for following expression and generate final code by clearly showing register descriptors and address descriptors. **07**

x = a * (b - c) ï d / (e +-f)

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)** Explain peephole optimization with its characteristics and examples. **07**

(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

OR

Q.5 **(a)** What are the Compiler Design issues? Explain in detail.

(b) List and explain the different tables created and used by the macro preprocessor **07**

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