DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER VI [INFORMATION TECHNOLOGY]
SUBJECT: (IT 608) LANGUAGE TRANSLATOR

Examination	**: Third Sessional**	**Seat No.**	**:**
Date	**: 31/03/2018**	**Day**	**: Saturday**
Time	**: 12:00 to 1:15**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.
5. Here | is rule separator and ^ stands for NULL.

Q.1 Do as directed.

(a) If you were to design a compiler, would you provide optimization phase? Why? (only key points require) **[2]**

(b) Generate intermediate code for given source code. **[2]**
x = a[i][j] + b[2];

(c) Represent three address code using Quadruples and triples for given on expression. **[4]**
a = a + a * (b – c) ;

(d) Define copy & restore and call by name using one unique example output. (No marks for theory explanation) **[4]**

Q.2 Attempt the following questions. **[12]**

(a) Consider following program written in " lexical scoped non-nested procedural language" **[6]**

```
int f(int n){
  static int r = 0;
  if (n<=0) return 1;
  if(n>3)  {
    r = n;
    return f(n-2)+2;   }
  return f(n-1)+r;  }
```

What is value of f(5)? Explain your answer showing the snapshots of memory layout at run-time using Activation tree & Records.

(b) Compare three different storage allocation with proper example in term of pros & cons and language support. **[6]**

OR

(b) Give syntax directed definition to produce three address code for assignments. **[6]**
S->id:=E E-> E1 +E2 E-> E1* E2 E->-E1 E->(E1) E->id

Q.3 (a) Give assembly code generated by a simple code generator for following statement **[6]**
x = (a+b) –((c+d)-e). Assume the target machine has 2 registers. Also list the issues in the design of code generator

(b) Generate intermediate code representation for following program fragment. **[6]**

```
#include <stdio.h>
int gcd(int a, int b) {
      if (a == 0 || b == 0)
           return 0;
      if (a == b)
 return a;
       if (a > b)
      return gcd(a-b, b);
  return gcd(a, b-a); }

 int main() {
   int a = 98, b = 56;
   printf("GCD of %d and %d is %d ", a, b, gcd(a, b));
   return 0;. }
```

OR

Q.3 (a) Explain Given code optimization technique with proper example **[6]**

1. Common Sub Expression Elimination
2. Loop Fusion
3. Strength Reduction

(b) Translate the arithmetic expression (a + b ∗ c) + d + (a + b ∗ c) − d + e into: **[6]**

1. syntax tree
2. DAG (Directed Acyclic Graph) representation
3. Compare DAG and syntax tree.