(3hours)  Total Marks: 80

N.B:  (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five questions.
(3) Make suitable assumptions wherever necessary.

Q.1.  a)  Differentiate between System software & Application software.  [5]

b)  What is Left recursion? Check if the following grammar is left recursive, [05]
and take necessary action if it exists:

$$S \rightarrow SS + |SS * |a$$

c)  Discuss the forward reference problem in assembler with suitable [05]
example.

d)  Explain different functions of loader in detail.  [05]

Q.2.  a)  Explain any five code optimization in compiler designing with suitable [10]
example.

b)  Explain with the help of flow chart the working of two pass assembler [10]
along with databases used.

Q.3.  a)  Explain Design of Direct Linking Loader.  [10]

b)  Construct LL(1) parsing table for the following grammar:  [10]

$$S \rightarrow aBDh$$
$$B \rightarrow cC$$
$$C \rightarrow bC \mid \varepsilon$$
$$D \rightarrow EF$$
$$E \rightarrow g \mid \varepsilon$$
$$F \rightarrow f \mid \varepsilon$$

Q.4.  a)  Generate 3-address code for the following C program and construct flow [10]
graph with the help of basic blocks : (assume 4 memory locations for
integer ):

```
min=a[0];
for (i=1;i<n;i++)
    if(a[i]>max)
        max=a[i];
flag=1;
```

b)  With reference to MACRO, explain the following tables with suitable [10]
example:
i) MNT         ii) MDT               iii) ALA

Q.5.  a)  Explain design issues in code generation in detail.  [10]

b)  Explain Phases of compiler with following example  [10]
$$a = a * b - 5 * 3 / c$$

Q.6.  Write short note on:  [20]
a)  Three address code representation
b)  YACC
c)  Parameterized Macros
d)  Syntax directed translation

\*\*\*\*\*\*\*\*\*\*\*\*\*

X438Y37C668X438Y37C668X438Y37C668X438Y37C668