(Time: 3 Hours)   Total Marks: 80

N.B: (1) Question No. 1 is compulsory

(2) Attempt ant three questions out of remaining five questions

Q.1 (a) Differentiate between system software and application software. [05]

(b) Explain different functions of loader. [05]

(c) Explain forward reference problem and how it is handled in assembler design. [05]

(d) Explain macro and macro expansion. [05]

Q.2 (a) Find FIRST & FOLLOW for the following grammar [05]

S→Bb | Dd

B→aB | ϵ

D→cD | ϵ

(b) Generate three address code for following code [05]

```
while(a<b) do
    if(c<d) then
        x=y+2
    else
        x=y-2
```

(c) With reference to assembler explain the following table with suitable example [10]

(i)MOT   (ii)POT   (iii)ST   (iv)BT

Q.3 (a) Explain Synthesized and Inherited attribute with example. [10]

(b) Explain different code optimization techniques with example. [10]

Q.4 (a) Apply dead code elimination techniques for following code [05]

```
int count;
void foo( )
{
    int i;
    i=1;
    count=1;
    count=2;
    return
    count=3;
}
```

(b) Eliminate left recursion from the following grammar [05]

S→(L) | x

L→ L,S | S

(c) Explain different types of loaders in detail. [10]

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Q.5 (a) Draw flowchart of a Pass-I of two pass assembler design and explain in detail. [10]

(b) Explain different features of macro with example. [10]

Q.6 (a) For the following grammar construct LL(1) parsing table and parse the string (a-a) [10]

S→F
S→(S-F)
F→a

(b) Explain different issues in code generation. [10]

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