

(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]
 $S \rightarrow Bb \mid Dd$
 $B \rightarrow aB \mid \epsilon$
 $D \rightarrow cD \mid \epsilon$
 (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]
 $S \rightarrow (L) \mid x$
 $L \rightarrow L, S \mid S$
 (c) Explain different types of loaders in detail. [10]

- 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)
 $S \rightarrow F$
 $S \rightarrow (S-F)$
 $F \rightarrow a$ [10]
(b) Explain different issues in code generation. [10]
