

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

\*\*\*\*\*