T.E. (Information Technology) (Semester – II) Examination, 2010
SYSTEM SOFTWARE
(2003 Course)

Time : 3 Hours Max. Marks : 100

Instructions : *1) Answer **any three** questions from each Section.*
*2) Answers to the **two** Sections should be written in **separate** answer books.*
*3) Neat diagrams must be drawn **wherever** necessary.*
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data, if **necessary**.*

SECTION – I

1. a) List the system programs which reside in the system permanently. Briefly explain each one of these stating the reason why they must reside permanently in system. **8**

   b) Compare : Compiler and Interpreter. **2**

   c) Which of the following features are machine dependent and which are machine independent ? Justify your answer. **8**

      i) Addressing modes ii) Program relocation iii) Literals

OR

2. a) Comment on the statement : "Static binding leads to more efficient execution of a program than dynamic bindings". **4**

   b) Enlist the components of system software. **2**

   c) Write the significance of debug monitor. **4**

   d) With the help of a neat block diagram explain the structure of screen editor. **8**

3. a) What is an assembler ? Give an example. **2**

   b) With respect to the design of a **two** pass assembler, state whether the following statements are true or false. Justify your answer in each case.

      i) Literals are processed in PASS – II

      ii) Undefined symbols are detected in PASS-I

      iii) Incorrect op-codes are identified in PASS-I. **6**

   c) Can a one pass macro processor successfully handle a macro containing conditional macro pseudo-ops ? If not what modifications are necessary to enable it to handle such situations ? **8**

OR

4. a) For the following sample code show the output of PASS-I of two PASS assembler. Also show the entries in base register table.

```
SIMPLE   START   100
         BALR    15, 0
         USING   *, 15
LOOP     L       R1, TWO
         A       R1, FOUR
         ST      R1, FOUR
         CLI     FOUR+3, 4
         BNE     LOOP
         BR      14
R1       EQU     1
TWO      DC      F'2'
FOUR     DS      F
         END
```

10

b) What are the different ways in which we can specify the arguments to a macro call ? Briefly explain with the help of suitable examples. 6

5. a) Consider the following C code :

```
# include <stdio.h>
void main(void)
{
 int a=2,b=3,c=10;
 c=a+b+c;
}
```

Show the different tables generated by the lexical analyzer for this code. Also clearly show the contents of fixed table entries necessary for processing this input. 10

b) What problems does top-down parser faces due to left recursion ? Explain with a suitable example. 6

OR

6. a) What are the major problems faced by Shift Reduce parser ? Explain it with suitable example. **8**

   b) Consider the following grammar :

   $E \rightarrow E+E$

   $E \rightarrow E*E$

   $E \rightarrow a$

   Let the string s : a+a*a is to be prepared. Demonstrate with the moves of a shift reduce parser that ambiguity of "whether to shift or to reduce" may arise while attempting to parse the string s. **6**

   c) What do you mean by bootstrapping of compiler ? **2**

SECTION – II

7. a) Differentiate between machine dependent and machine independent optimization techniques in compiler. Explain in brief any one of these techniques. **8**

   b) Write an intermediate code in the form of triple and quadruple for the following expressions :

   $P = P \rightarrow next$

   $P \rightarrow next = NULL$

   (Clearly mention assumptions made if any) **8**

OR

8. a) Write an algorithm for code generation for "+" operator, assuming that the system has only two registers. **8**

   b) Write the Triple form for the following :

   $X = ++Y*Z$ **4**

   c) What is the need for generating intermediate code ? Explain. **4**

9. a) Explain Compile and Go (Assemble & Go) Loader. What are the Advantages & disadvantages of this type of Loader ? **8**

   b) Why are library routines usually relocatable ? What would happen if these routines are made non-relocatable ? **4**

   c) What is the benefit of treating an undefined external symbol to be the name of library routine ? **4**

OR

10. a) What are the various data structures/databases used for the design of direct linking loader ? 8

b) What is loader ? Explain the basic functions of a loader. 6

c) With respect to an absolute state **true** or **false** :

i) Allocation is done by programmer.

ii) Relocation is done by the loader. 2

11. a) Explain in brief how an OLE functions. 8

b) Explain the term dynamic data exchange. 8

c) What do you mean by an object library ? 2

OR

12. Write short note on :

i) Different methods of specifying link

ii) Call back functions

iii) Data formats for clip board. 18
