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T.E. (Computer) (Semester – II) Examination, 2010
(2003 Course)
SYSTEMS PROGRAMMING

Time : 3 Hours Max. Marks : 100

Instructions : *1) Answer **any 3** questions from **each** Section.*
*2) Answers to the **two** Sections should be written in **separate** 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) What is language processor ? Explain various language processing tools. **8**

   b) With respect to the two pass assembler, which of the pass is responsible for the following activities
      i) Object code generation
      ii) Entry of literals into the literal table
      iii) Invalid mnemonic check
      iv) Address resolution of local symbols **4**

   c) Define :
      i) Assembler
      ii) Macro **2**

   d) Match the following : **4**

i) Macro definition table	a) Switch
ii) Macro name table	b) Macro call
iii) Argument list array	c) MDT index
iv) Macro definition level counter	d) Index marker

OR

2. a) Comment on the statement : "Programs with macros require more space at run time than program with functions". **4**

   b) Name the feature of macro that forces us to use stack. Explain in brief with the help of an example. **4**

   c) What feature of assembler makes it mandatory to design a two pass assembler ? Explain with the help of an example. **6**

P.T.O.

d) Comment on the following statements :

i) In certain cases Assembly language programming holds an edge over high level language programming.

ii) "Macros can not detect instructional errors i.e. errors in op-codes". 4

3. a) What do you mean by overlay structure ? Discuss advantages of the same. 4

b) Explain compile-and-go loader scheme. What are its advantages and disadvantages ? 8

c) Compare .EXE and .DLL file. 4

OR

4. a) Explain design of MS-DOS linker. 8

b) What information must be provided by an assembler to the direct linking loader ? Explain significance of this information with respect to design of direct linking loader. 8

5. a) Write an algorithm for lexical analyzer. 8

b) Explain how to eliminate problem of left recursion and left factoring in top down parsing. 8

OR

6. a) For the following program write output of Lexical analyzer. Show contents of all the tables. (in-built and generated)

```
main( )
{
    int a, b, c, d;
    a=10;
    b=20;
    c=a+b;
    d=c/a;
}
```

8

b) Explain Recursive descent parser with an example. 8

SECTION – II

7. a) Compare multi-programming and time-sharing systems. **4**

   b) With the help of an example explain priority scheduling. What is starvation ? How to overcome this problem ? **8**

   c) For the following set of processes calculate average turn around time using FCFS scheduling. Also draw Gantt chart. **4**

Process	Arrival time	Burst time
P1	0.000	3
P2	1.001	6
P3	4.001	4
P4	6.001	2

OR

8. a) For the following set of processes calculate average waiting time using preemptive shortest job first scheduling. Also draw Gantt chart. **8**

Process	Arrival time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

   b) Describe the difference between short term, medium term and long term scheduling. **8**

9. a) Explain the need of demand paging. **8**

   b) What do you mean by compaction ? Explain with example. **8**

   c) What is page fault ? **2**

OR

10. a) Compare following :

i) Internal and external fermentation

ii) Logical and physical address **8**

b) For the following reference string how many page faults will occur using LRU and optimal page replacement scheme. Compare the results. **10**

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2

11.a) What are different file access methods ? Briefly discuss. **8**

b) Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143. The queue of pending requests in FIFO is :

86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130

Starting from the current head position what is the total distance that the disk arm moves to satisfy all the pending requests for FCFS and SSTF disk scheduling algorithm. **8**

OR

12. a) Compare linked and indexed allocation with example. **8**

b) With example explain various free space management techniques. **8**
