



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

- b) An assembly language program contains the statement

`X EQU Y+25.`

Indicate how the EQU statement can be processed if

- i) Y is back reference  
ii) Y is forward reference. 6
- c) 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 opcodes". 4

**OR**

**P.T.O.**



2. a) Show the Macro Definition Table, Macro Name Table entries and the output text generated by the macro-processor for the following input code.

ALPHA	MACRO	W
BETA	MACRO	X
	ADD	X
GAMMA	MACRO	Y
	WRITE	Y
	MEND	GAMMA
	MEND	BETA
	LOAD	W
	MEND	ALPHA
GAMMA	MACRO	Z
	ALPHA	A
	BETA	B
	STORE	Z
	MEND	GAMMA
	GAMMA	C
	GAMMA	C



- b) How are the literals handled in an assembler ? Show all the data structures required for processing of literals. Give appropriate examples. 8
- c) What are imperative statements ? 2
3. a) Comment on the statement “Static binding leads to more efficient execution of a program than dynamic bindings”. 4
- b) How can a linker resolve symbols defined to be as synonyms of externally defined Symbols ? 6
- c) What information must be passed on by an Assembler to a direct linking loader ? 6

OR

4. a) Explain Compile & Go (Assemble & Go) loader. What are the advantages and 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



5. a) Consider following program as input to Lexical analyzer. Generate the output tables.

```
#include "stdio.h"
```

```
int i;
```

```
i=10
```

```
char [10] c;
```

```
void main ()
```

```
{
```

```
c[1]=0;
```

```
}
```

Are there any errors in the program ? If yes how are they handled by the Lexical analyzer ?

8

- b) Explain the purpose of various phases of compiler. Clearly mention the required input and output generated by each of these phases.

8

OR

6. a) Distinguish between :

i) Pass and Phase

ii) Machine dependent and Machine Independent phases of the compiler.

4



What kinds of errors that can be detected in a source program during.

- i) SYNTCATIC ANALYSIS
  - ii) CODE GENERATION. 8
- b) State **true** or **false**
- i) Top Down parsing is also called as recursive descent parsing.
  - ii) Predictive parsing and Bottom up parsing are one and the same.
  - iii) LL parser is a type of predictive parsing
  - iv) The output of lexical analyzer is given to the parser. 4

## SECTION – II

7. a) List the essential differences between: Batch system, real time system and time sharing system. 8
- b) What is an operating system ? What are the basic services and functions of an operating system ? 8

OR

8. a) What are the main components of operating system ? Explain in brief. 8
- b) Using simple system call as an example describe the steps generally involved in providing the result for the point of calling the function in C library to the point where that function returns. 8



9. a) Considering the pages, frames, page tables and memory management units describe page based virtual memory. 8
- b) Given the memory partitions of size 100k, 500k, 200k, 300k and 600k (in order), how would each of the First-Fit, Best-Fit and Worst-Fit algorithms place the process of 212k, 417k, 112k and 426k (in-order) ? 8

OR

10. a) Considering the components of memory address, the segment table and its contents, physical address formation describe segmentation based virtual memory. 8
- b) What are the pros and cons for increasing the page size ? 4
- c) What do you mean by page fault ? How the operating system handles this ? 4
11. a) Describe buffering in the I/O subsystem of an operating system. Give reasons why it is required, and give a case where it is an advantage and a case where it is a disadvantage ? 8
- b) A disk has 640 cylinders numbered 0-639. The drive is currently serving the request 68. The tracks to be read are in the following order:  
84, 154, 32, 128, 10, 133, 61, 69

Start from the current head position. What is the total difference that disk arm moves to satisfy all the pending requests for the following disk scheduling algorithms.

i) Shortest Seek Time First

ii) C-SCAN (assuming head movement towards left to right)

10.

OR



12. a) Write a short note on : Disk Performance Parameters. 6
- b) Explain in brief: 8
- i) Programmed I/O
  - ii) Interrupt driven I/O.
- c) Explain linked disk space allocation method. 4
- 

B/I/10/7,115