



Name :

Roll No. :

Invigilator's Signature :

**CS/M.Tech(CSE)/SEM-1/CS-903/2009-10
2009**

**SYSTEMS PROGRAMMING & OPERATING
SYSTEMS**

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

$$10 \times 1 = 10$$

- i) System software is a program that directs the overall operation of the computer facilitates its use and interacts with the user. What are the different types of this software ?
 - a) Operating system b) Languages
 - c) Utilities d) All of these.
- ii) Which of the following systems software does the job of merging the records from two files into one ?
 - a) Security software
 - b) Utility program
 - c) Network software
 - d) Documentation system.



- iii) All time of a computer is switched on, its operating system software has to stay in
- a) Primary storage b) Main storage
 - c) Floppy disk d) Disk drive.
- iv) What is the name given to the values that are automatically provide by software to reduce key strokes to improve a computers users productivity ?
- a) Defined values b) Fixed values
 - c) Default values d) Special values.
- v) A form of code that uses more than one process and processor, possibility of different types and that may on occasions have more than one process or processor active at the same time, is known as
- a) multiprogramming b) multithreading
 - c) broadcasting d) time-sharing.
- vi) Which of the following is not a function of bootstrap program ?
- a) Initializing the CPU
 - b) Initializing the memory contents
 - c) Loading the OS
 - d) Loading the compiler.
- vii) Where does the swap space reside ?
- a) RAM b) Disk
 - c) ROM d) On-chip cache.



- viii) Memory protection is normally done by
- the processor and the associated H/W
 - the OS
 - the compiler
 - the user program.
- ix) Which of the following does not interrupt a running process ?
- A device
 - Timer
 - Scheduler process
 - Power failure.
- x) Consider a machine with 64 MB physical memory and a 32-bit virtual address space. If the page size is 4 kb, what is the approximate size of the page table ?
- 16 Mb
 - 8 Mb
 - 2 Mb
 - 24 Mb.

GROUP – B

(Short Answer Type Questions)

Answer any *two* of the following. $2 \times 10 = 20$

- With a neat sketch, describe the process state diagram. Describe any two process scheduling algorithms. 5 + 5
- Write an algorithm for the readers/writers problem. Describe various principles (important) of deadlock. 5 + 5
- Define a macro. What are the advanced macro facilities ? Describe the design issues of an assembler. 5 + 5



GROUP – C

(Long Answer Type Questions)

Answer any *two* of the following.

2 × 20 = 40

5. Why is `perror()` used ? Write down a program that shows the use of multiple `fork()` s. What do you mean by catchable and non-catchable signals ? Explain algorithm for `fork()` in details.
6. Write down a program for orphan process. What is symbolic link ? Describe one of the disk space management scheme. Compare and contrast two-level directory and single level directory structure with proper diagram.
7. Describe the design of two-pass assembler. What do you mean by literal ? What are the assembler directives ? Why Pseudo-Operation Table (POT) is used ? Describe & draw (if possible) a schematic diagram of pass 1 and pass 2 assembler with actual function. Compare machine level language and assembly level language.

2 + 6 + 6 + 6

8 + 2 + 5 + 5

4 + 2 + 2 + 2 + 6 + 4
