Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.TECH(CSE)(OLD)/SEM-1/PGCS-903/2011-12

2011
SYSTEM PROGRAMMING AND OPERATING SYSTEM

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 × 1 = 10

   i) System software is a program that directs the overall operation of the computer which 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 if 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 provided by software to reduce key strokes to improve a computer's 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

a) the processor and the associated H/W

b) the OS

c) the compiler

d) the user program.

ix) Which of the following does not interrupt a running process ?

a) A device b) Timer

c) Scheduler Process d) 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 page table ?

a) 16 MB b) 8 MB

c) 2 MB d) 24 MB.

GROUP – B

Answer any *two* of the following. 2 × 10 = 20

2. With a neat sketch describe process state diagram. Describe any two process scheduling algorithms. 5 + 5

3. Write an algorithm for readers / writers problem. Describe various important principles of deadlock. 5 + 5

4. Define a macro. What are the advanced macro facilities ? Describe the design issues of an assembler. 1 + 4 + 5

GROUP – C

Answer any *two* of the following. 2 × 20 = 40

5. Why perror () is 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 detail.

2 + 6 + 6 + 6

6. Write down a program for orphan process. What is symbolic link ? Describe one of the disk space management schemes. Compare and contrast two-level directory structure and single-level directory structure with proper diagram.

8 + 2 + 5 + 5

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.

4 + 2 + 2 + 2 + 6 + 4