(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1431 Roll No.

M.C.A.

(SEM. III) EXAMINATION, 2008-09

OPERATING SYSTEM

Time : 3 Hours] *[Total Marks : 100*

Note : (1) Attempt ***all*** *questions.*

(2) All questions carry ***equal*** *marks.*

1 Attempt any **four** of the following questions : **5×4=20**

(a) What is an operating system ? What are the main functions of an operating system ? Write in detail.

(b) What are the main difficulties in writing an operating system for a real time environment.

(c) What is multiprogramming ? What are the main advantages of multiprogramming ?

(d) Why spooling is necessary for batch multiprogramming ? Is it needed for time shared system ?

(e) Suggest a scheme for implementing the current directory scheme efficiently; explain with example.

(f) Explain the concept of Virtual Machine.

2 Attempt any **four** parts of the following : **5×4=20**

(a) Explain the operation of multilevel scheduling. What advantage is there in having different quantum size on different levels of multiprograming.

(b) Describe the differences between short term, medium term and long term scheduling.

(c) A CPU scheduling algorithm determine an order for the execution of its scheduled jobs. Given n jobs to be scheduled on one processor, how many possible different schedules are there ?

(d) What are the performance criteria used to evaluate CPU scheduling algorithm ?

(e) Explain the difference between logical and physical addresses.

(f) Explain the concept of process and processors. How are they different ? Also describe process control block.

3 Attempt any **two** of the following : **10×2=20**

(a) (i) What is the basic requirement for the execution of concurrent processes ?

(ii) Define deadlock. And write and explain Banker's Algorithm for deadlock avoidance.

(b) (i) What is a Semaphore ? What types of operation can be performed on semaphore ?

(ii) What is the difference between binary semaphore and general semaphore. Explain with example.

(c) (i) Explain monitors with suitable example.

(ii) What conditions are generally associated with reader/writers problems ?

4 Attempt any **two** of the following questions : **10×2=20**

(a) Explain the following allocation algorithm in detail :

(i) First fit

(ii) Best fit.

(b) (i) Describe a mechanism by which one segment could belong to the address space of two different processes.

(ii) Why are segmentation and paging sometimes combined into one scheme ? - Explain.

(c) What relationship exists between the choice of a system file structure and system's virtual memory ? Explain with example

Attempt any **two** of the following questions : **10×2=20**

(a) List some benefits and disadvantages of blocking and nonblocking primitives for message passing.

(b) Explain the purpose of sockets interface in detail with example.

(c) How the process management is :

(i) Performed in the Linux operating system

(ii) Compare the Linux file system with Windows NT file system.

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PAPER ID : 1431 Roll No. | | | | | | | | | | |

M.C.A.

(SEM. III) EXAMINATION, 2007-08

OPERATING SYSTEM

Time : 3 Hours] *[Total Marks : 100*

Note: *Attempt **all** questions.*

1 Attempt any **two** parts of the following : **2×10=20**

(a) Discuss the following :

(i) Batch system

(ii) Time-sharing system

(iii) Multiprocessor systems

(iv) Spooling.

(b) (i) What are the different operating system architectures? Explain each of them.

(ii) What are the main four functions of an operating systems ? Explain in detail.

(c) Discuss the differences among the following :

(i) Multi programming and multitasking.

(ii) Parallel systems and distributed system.

2 Attempt any **two** parts of the followings : **2×10=20**

(a) What is a thread? How thread is different from a process ? What resoures are used when a thread is created ?

(b) Consider the following table :

Process	*Burst time*	*priority*	*Arrival time*
P1	10 ms	4	1 ms
P2	12 ms	3	0 ms
P3	5 ms	2	2 ms
P4	8 ms	1	4 ms

Provide the schedule using pre-emptive shortest job first and pre-emptive priority scheduling and calculate average waiting time for each of the above.

(c) Explain the followings :

(i) Process state transition diagram
(ii) Inter process communication
(iii) Dispatch Latency
(iv) Isolated process

Attempt any **two** parts of the followings : **2×10=20**

(a) Explain and solve Readers – Writers problem using semaphores.

(b) Discuss Banker's algorithm with the help of an example.

(c) Explain the followings :

(i) Necessary and sufficient condition for deadlock
(ii) Deadlock recovery
(iii) Counting semaphore.

Attempt any **four** parts of the followings : **5×4=20**

(a) Explain the following allocation algorithm :

(i) First – Fit
(ii) Best – fit
(iii) Worst – fit

(b) Consider the following page reference string 1,2,3,4,2,4,5,6,3,1,2,3,4,6,4,5,2,6. How many page fault occur assuming three frames for LRU and FIFO replacement algo ?

(c) What is Belady's anamoly? Explain with the help of an example.

(d) Discuss any two disk scheduling algorithm in brief.

(e) What do you mean by demand paging? – Explain.

(f) Describe the following :
   (i) Overlay
   (ii) Thrashing.

5 Attempt any **four** parts of the following : **5×4=20**

(a) What do you understand by Linked allocation strategy ? Explain with an example.

(b) Discuss the general module of a file system.

(c) Discuss about the Linux file system.

(d) What are block and character devices? Differentiate between blocking and non-blocking I/O devices.

(e) Discuss the various security measurements for developing a secured operating system.

(f) Write short notes on the following :
   (i) Kernel module
   (ii) Time stamp method.

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PAPER ID : 1431 Roll No.

MCA

THIRD SEMESTER EXAMINATION, 2006-07

OPERATING SYSTEM

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt ALL questions.*

(ii) All questions carry equal marks.

(iii) In case of numerical problems assume data wherever not provided.

(iv) Be precise in your answer.

1. Attempt *any four* parts of the following : **(5x4=20)**

(a) (i) What are the main purposes of an Operating System ?

(ii) What do you understand by System Call ? Explain.

(b) Define the essential differences between the following type of operating system :

(i) Batch

(ii) Interactive

(iii) Time Sharing

(iv) Real-time

(c) What are the main advantages of multi-programming. Explain with example.

(d) Explain the concept of Virtual Machines.

(e) Differentiate between concurrent processing, parallel processing and serial processing.

(f) What is a Semaphore ? Explain its uses in interprocess communication.

2. Attempt *any four* parts of the following : (5x4=20)

(a) What are the functions of a Process Management System ?

(b) Explain the objectives and implementation of short term scheduling and medium term scheduling.

(c) Describe the performance criteria used to evaluate C.P.U. scheduling algorithm.

(d) Define the difference between pre-emptive and non pre-emptive scheduling 'State why strict non pre-emptive scheduling is unlikely to be used in a computer centre.

(e) Differentiate clearly between process and thread and how and where they are used.

(f) Differentiate between a multilevel feedback scheduling algorithm and multiqueue (foreground/background) CPU scheduling algorithm which uses round robin for the foreground and pre-emptive priority algorithm for back ground.

3. Attempt *any two* parts of the following : (10x2=20)

(a) What is the distinction between competing processes and cooperating processes. List the three control problems associated with competing processes and briefly define each.

(b) (i) What is Mutual Exclusion ? List the requirements for mutual exclusion.

(ii) Explain monitors with suitable example.

(c) (i) What conditions are generally associated with readers/writers problem. Explain briefly.

(ii) What is the distinction between blocking and nonblocking with respect to messages ?

4. Attempt *any two* parts of the following : **(10x2=20)**

(a) Explain the difference between logical and physical addresses. Consider a paging system with the page table in memory.

(i) If a memory reference takes 1.4 micro second how long does a paged memory reference take ?

(ii) If we add 8 associative registers and 75% of all page table references are found in the associative registers. What is the effective memory reference time ? (Assume that finding a page table entry in the associative registers takes zero time if it is there).

(b) (i) Explain the difference between internal and external fragmentation.

(ii) What do you understand by Thrashing ? What are measures taken to avoid thrashing ?

(c) (i) Why are segmentation and paging some times combined into one scheme explain with example.

(ii) When do page faults occur ? Describe the actions taken by the operating system when a page fault occurs.

Attempt *any two* parts of the following : (10x2=20)

(a) (i) What protection problem may arise if a shared stack is used for parameter passing ?

(ii) What are the security issues related to operating system design ?

(b) Compare the Linux file system with windows NT file system and which will be better under what conditions.

(c) What is the need to know principle ? Why is it important for a protection system to adhere to this principle ?