2003 CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING(C-DAC) M.C.A

END-TERM EXAMINATION
THIRD SEMESTER [MCA] - DECEMBER 2003

Paper Code: MCA 201

OPERATING SYSTEM

Time: 3 Hours
Marks: 70

Q. 1.(a) Define the essential properties of the following types of Operating Systems:- 6

(i) Batch (ii) Interactive
(iii) Time Sharing (iv) Real Time
(v) Network (vi) Distributed

(b) What are the differences between a trap and an interrupt? What is the use of each function? 6

Q. 2.(a) Describe the actions taken by a thread library to context switch between user-level threads. 6

(b) Describe the differences among short-term, medium-term and longterm scheduling. 6

Q. 3. Consider the following set of process, with the length of the CPU burst time given in milliseconds
12
Process Burst Time Priority
P1 10 3
P2 1 1
P3 2 3
P4 1 4
P5 5 2
The process are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

(a) Draw four Gantt charts that illustrate the execution of these processes using FCFS, SJF, A non preemptive priority and RR (quantum=1) scheduling.
(b) What is the turnaround time of each process for each of the scheduling algorithm in part (a)?
(c) What is the waiting time of each process for each of the scheduling algorithm in part (a)?
(d) Which of the schedules in part (a) results in the minimal average waiting time (over all process)?

Q. 4.(a) Describe the following allocation algorithms:- 6
(i) First Fit (ii) Best Fit
(iii) Worst Fit

(b) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. 6
(i) How many bits are there in the logical address?
(ii) How many bits are there in the physical address?

Q. 5. Consider the following page reference string:-
12
1, 2, 3, 4, 2, 1, 5, 6, 1, 2, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6
How many page faults would occur for the following replacement algorithm, assuming one, two, three, four, six, or seven frames?
(a) LRU Replacement (b) FIFO Replacement
(c) Optimal Replacement

Q. 6.(a) Explain the purpose of the open and close operation. 6
(b) What problem could occur if a system allowed a file system to be mounted simultaneously at more than one location? 6

Q. 7. Write short notes on any two :-
12
(a) PCB
(b) Segmentation
(c) Disk Structure