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M.C.A. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Third Semester

CA 232 OPERATING SYSTEMS

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A —ʼ(10 × 2 = 20 marks)

1.   Under what circumstances would a user be better off using a time – sharing system, rather than a personal computer or single – user workstation?

2.   Which of the following instructions should be privileged?

    (a)   Read the clock

    (b)   Clear memory.

3.   What is preemptive scheduling?

4.   What is short term scheduling?

5.   What is busy waiting?

6.   What is a semaphore?

7.   Differentiate external and internal fragmentation.

8.   Consider a logical address space of 8 pages of 1024 words each, mapped onto a physical memory of 32 frames.

    How many bits are there in the logical and physical address?

9.   What is the consistency semantics followed in Unix?

10.   What are the system calls associated with a process in Unix?

PART B — (5 × 16 = 80 marks)

11.   (i)   Explain the various layers that constitute a file system.   (5)

    (ii)   Explain the various access methods.   (4)

    (iii) Explain the directory structure organization.   (7)

12. (a) (i) Explain the evolution of operating system. (12)

(ii) Explain how parameters can be passed to system calls. (4)

Or

(b) (i) Explain how memory. I/O and CPU protection can be achieved. (8)

(ii) Compare the command – interpreter of DOS and Unix. (4)

(iii) Differentiate policy and mechanism. (4)

13. (a) (i) Explain the various state, a process could exist in with the help of process state diagram. (4)

(ii) Explain multilevel queue scheduling. (4)

(iii) Find the average turnaround time and waiting time using FCFS scheduling. (4)

Process	Burst time
P1	24
P2	3
P3	3

(iv) Find the average turnaround time and waiting time using priority scheduling. (4)

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

Or

(b) (i) Explain how a process is represented in memory. (4)

(ii) Explain multilevel feedback queue scheduling. (4)

(iii) Find the average turnaround time and waiting time using SJF scheduling. (4)

Process	Burst time
P1	6
P2	8
P3	7
P4	3

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(iv) Find the average turnaround time and waiting time using Round robin scheduling. Take the time quantum as 4 ms. (4)

Process	Burst time
P1	24
P2	3
P3	3

14. (a) (i) Write and explain two algorithms to solve critical section problems. (8)

   (ii) Explain how deadlock can be prevented. (8)

Or

(b) (i) Write any Two problems which need synchronization. Give the algorithm for achieving synchronization. (8)

   (ii) What is wait-for-graph? Give an example. (3)

   (iii) For the following situation find out whether the system is in a deadlock state or not. Find out the total instances of the resources? (5)

	Allocation			Request			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	0	0	0	0	0	0
P1	2	0	0	2	0	2			
P2	3	0	3	0	0	0			
P3	2	1	1	1	0	0			
P4	0	0	2	0	0	2			

15. (a) (i) Explain the paging hardware and explain how sharing can be achieved using paging. (8)

   (ii) Explain Belady's anamoly. Give an example. (3)

   (iii) Apply FIFO and optimal page replacement algorithms using 3 frames and determine the number of page faults. The reference string is 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1 (5)

Or

(b) (i) Explain the various methods for allocating disk space. (6)

   (ii) Compare the various disk scheduling algorithms. (6)

   (iii) Suggest a method for implementing free space management. (4)

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