

# END TERM EXAMINATION

THIRD SEMESTER [MCA] December-2009

Paper code:MCA201	subject:operating system
Paper id-44201	(batch:2004-2008)
Time:3 hours	Maximum
Note: Q1 is compulsory. Attempt one question from each unit.	

Q1 Answer all the following question briefly:- **(2X10=20)**

- (a) What are the advantages of having different time quantum sizes on different level of a multilevel queuing system?
- (b) Write an algorithm to solve problem of critical section among two processes.
- (c) Differentiate between constant linear velocity and constant angular velocity of disk structure.
- (d) Explain file allocation method implanted in unix.
- (e)
- (f) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. how many bits are there in the logical address? How many bits are there in the physical address?
- (g) Describe a mechanism by which one segment could belong to the address space of two different processes?
- (h) What is Belady's Anomaly? explain.
- (i) "degree of multiprogramming control the performance of the computing system"- comment.
- (j) How thread creation differ from that of process creation? Briefly explain.

## UNIT-I

Q2 consider the following page reference string:-  
4,6,8,0,4,9,3,2,4,6,2,9,3,0,3,6,4,7. Assume there are four frames. How many page faults will occur for the following replacement algorithms(show computation)? which one is best algorithm? **(10)**

- (a) LRU replacement
- (b) FIFO replacement
- (c) LFU replacement
- (d) Optimal page replacement

Q3 (a) why are segmentation and paging sometime combined into one scheme? What are their Advantages and disadvantages? **(5)**

(b) given the memory partition of 400K,100K,500K,800K (in order) how would each of the First-fit, best-fit and worst-fit algorithms place processes of 190K,420,171K,540K(in Order)? which algorithm makes the efficient use of memory? **(5)**

**UNIT-II**

- Q4 (a) explain dining philosopher's problem with its algorithm. **(6)**
- (b) when virtual memory is implemented in a computing system, it carries certain cost and certain benefits. List those costs and the benefits. It is possible for the costs exceed the benefits. Explain what measures you can take to ensure that this imbalance does not occur. **(4)**
- Q5 consider the processes listed in the following table, using priority scheduling for:-(a) preemptive and (b) non-preemptive

process	Arrival time	Burst time	Priority no.
A	0	2	2
B	0	7	4
C	1	3	1
D	3	1	5

Answer the following:-

- (i) Draw gantt charts illustrating the execution of these processes. **(10)**
- (ii) What is the turnaround time of each process?
- (iii) What is the average throughput of each of these?
- Note that the small integer value (of priority no) indicate high order of priority.

**UNIT-III**

- Q6 consider the following snapshots of a system:-

	Allocation ABCD	Max ABCD	Available ABCD
P0	0012	0012	1520
P1	1000	1750	
P2	1354	2356	
P3	0632	0652	
P4	0014	0656	

Answer the following questions using the banker's algorithms:-

- (a) What is the content of the matrix need? **(10)**
- (b) Is the system in a safe state?
- (c) If a request from process P1 arrives for (0 4 2 0) can request be granted immediately.
- Q7 (a) suppose that a disk has 5000 cylinder numbered 0 to 4999. The drive is currently at 143 and previous record was at 150. The queue of pending request, in FIFO is 28, 1470, 913, 2050, 1509, 1022, 20, 389, 4888, 260. Starting from current head position, what is total distance that disk moves to satisfy all pending request for each if the following algorithms:-
- (i) SSTF                      (ii) SCAN              (iii) LOOK                      **(6)**
- (b) explain secondary storage structure having constant access time  $T(i,j)$ . **(4)**

**UNIT-IV**

- Q8 (a) explain the sequential and direct file access method. How can a sequential file be simulated on a direct access file? Explain. **(5)**
- (b) what is logical file system? How it is different from that of physical file system? Explain with examples. **(5)**
- Q9 write short notes on any two of the following:- **(5X2=10)**
- (a) Clustered vs. Distributed system
  - (b) Deadlock prevention vs. deadlock avoidance
  - (c) Process control block