

- (b) What is access matrix? Why an operating system needs matrix? Discuss.
- (c) Write and find safe sequence using the banker's algorithm for the following snapshot

	Allocation	Max	Available
	ABC	ABC	ABC
P0	0 1 0	7 5 3	3 3 2
P1	2 0 0	3 2 2	
P2	3 0 2	9 0 2	
P3	2 1 1	2 2 2	
P4	0 0 2	4 3 3	

- i) What is the content of matrix need?
- ii) Check the system for safe stage.
- iii) Process *P1* request (1,0,2). Can the request be granted?



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

PAPER ID : 194403

Roll No.

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MCA-DUAL DEGREE
(SEM. II) THEORY EXAM. 2014-15
OPERATING SYSTEM

Time : 3 Hours]

[Total Marks : 100

Note : Attempt the questions as indicated.

Q1. Attempt any *four* questions from the following : 5x4=20

- (a) What is an operating system? Discuss the main services of the operating system.
- (b) Discuss the main purpose of system call and system programs.
- (c) What are the difference between hard real time system and soft real time system?
- (d) What is multiprogramming and multitasking?

- (e) What do you mean by Kernel? Explain microkernel.
- (f) What is process control block? Explain all its components.

Q2. Attempt any *four* questions from the following : 5x4=20

- (a) Briefly discuss the virtual machine.
- (b) Explain the term CPU scheduling. Discuss the scheduling objectives in brief.
- (c) Write an algorithm to explain the producer / consumer using semaphore.
- (d) Consider the following set of process, with the length of CPU burst time given in milliseconds

Process	Burst Time
P1	12
P2	8
P3	4
P4	6

Calculate the average waiting time and turn around time for SJF scheduling.

- (e) Define multilevel feedback queue in brief.
- (f) What is inter process communication? Discuss.

Q3. Attempt any *two* questions from the following : 10x2=20

- (a) Define deadlock. Give four conditions for occurrence of deadlock. How it can be prevented?
- (b) Explain Banker's algorithm. What is its use? Explain using suitable example.
- (c) What is safe state? What is its use in deadlock avoidance? Explain it using an example.

Q4. Attempt any *two* questions from the following : 10x2=20

- (a) What is disk scheduling? Explain it using an example taking any two-disk scheduling.
- (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.
Calculate number of page faults using LRU and OPTIMAL page replacement algorithm. Assume number of frames as three.
- (c) Define the following :
 - i) Virtual memory
 - ii) Thrashing
 - iii) Compaction

Q5. Attempt any *two* questions from the following : 10x2=20

- (a) What are the protection and security methods used in an operating system? Explain domain of protection.