(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 *P*1 request (1,0,2). Can the request be granted?

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NBC203

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

PAPER ID : 194403

Roll No.

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.