Roll No.										

Paper Code: MCA-311

MCA
THIRD SEMESTER EXAMINATION, 2016-2017
OPERATING SYSTEMS

[Time: 3 Hours] [Total Marks: 100]

Note: Attempt ***ALL*** questions. Assume suitable data, if required. All question carry equal marks.

1. Attempt any ***TWO*** of the following**: -** **(10x2=20)**

(a) What is an operating system? Why operating system is called as resource manager? Discuss various resources managed by O.S.

(b) (i) What do you understand by virtual machine? Also discuss the functions of main components of it.

(ii) Explain why system calls are required.

(c) Define the following terms:-

(i) Multiprogramming System

(ii) Multiprocessing System

(iii) Real Time System

(iv) Multithreading

2. Attempt any ***TWO*** of the following**: -** **(10x2=20)**

(a) Explain the following scheduling algorithms with suitable examples.

(i) First Come First Serve (FCFS) scheduling

(ii) Shortest job first (SJF) scheduling

(b) Discuss how multi level feedback queues meet each of the following scheduling goals.

(i) favor short jobs

(ii) favor I/O- bound jobs to get good I/O device utilization.

(c) Discuss the following:-

(i) Performance criteria of a CPU scheduling algorithms

(ii) Process State Transition

3. Attempt any ***TWO*** of the following**: -** **(10x2=20)**

(a) Consider the following snap-shot of a system.

	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) Obtain the need matrix.

(ii) is the system in a safe state? If a state is safe show it is possible for all processes to complete.

(b) state dining philosophers problem. Also give a solution to the problem.

(c) (i) What is critical section? Write a solution for critical section.

(ii) define the term deadlock. Discuss the necessary conditions of deadlock.

4. Attempt any ***TWO*** of the following**: -** **(10x2=20)**

(a) Explain the following disk scheduling algorithms with suitable example:-

(i) FCFS scheduling (ii) SSTF scheduling (iii) SCAN scheduling

(b) Consider the following page reference string:-

7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1

Assume three page frames, how many page faults would occur for following replacement algorithms, remember that all frames are initially empty

(i) FIFO replacement (ii) LRU replacement (iii) OPTIMAL replacement

(c) Discuss the following with the help of example-

(i) Paging

(ii) Locality & Thrashing

5. Write short notes on any ***TWO*** of the following**: -** **(10x2=20)**

(a) File systems

(b) Windows NT

(c) Security Threats