Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

V SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING)

MAKEUP EXAMINATIONS, DEC 2016/Jan 2017

SUBJECT: OPERATING SYSTEMS [CSE 3102]

REVISED CREDIT SYSTEM
(05/01/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A. Explain dual mode operation with neat diagram **3M**

1B. What are the different operating system services which are helpful for users? Explain with neat diagram. **4M**

1C. Explain Apple Mac OS X operating system structure with neat diagram. **3M**

2A. What are the roles of long-term scheduler, short term scheduler and medium term scheduler in the context of process scheduling? **3M**

2B. Explain different threading issues used in multithreaded programming. **3M**

2C. Explain Round Robin scheduling algorithm for following set of processes. Assume quantum = 2milli seconds.[Note: P_i is in the front of the ready queue if P_i and P_j processes arriving at the same time where i<j)] **4M**

Processes	**Burst Time (in milli seconds)**	**Arrival Time**
P1	15	7
P2	6	0
P3	3	5
P4	1	0
P5	9	6
P6	4	5

Draw Gantt Chart and calculate average waiting time and average turn- around time.

3A. What is semaphore? Explain wait() and signal() operation with an example. **2M**

3B. Explain Peterson's solution to the critical section problem along with data structures and structure of process Pi. Justify your answer. **4M**

3C. Consider a system with 5 processes P0 through P4 and three resource types A, B, and C. Resource type A has 11 instances, resource type B has 6 instances and resource type C has 8 instances. Apply banker's algorithm for the following snapshot of the system at time T_0 .

	Allocation	Max	Available	
	A B C	A B C	A B C	
P0	0 1 0	7 5 3	4 4 3	**4M**
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		

4A. Explain Paging hardware with TLB with neat diagram. How do you calculate effective memory-access time with 95% hit ratio? Assume it takes 20 nanoseconds to search the TLB and 110 nanoseconds to access memory. During TLB miss, the memory access for 'page table and frame number' and then access desired byte in memory requires 100 nanoseconds. **3M**

4B. What is demand paging? List the steps involved in handling a page fault with neat diagram. **4M**

4C. Differentiate between single level directory and Two-level directory with neat diagram **3M**

5A. What do you mean by bad blocks on disk? Explain the steps used in sector sparing and sector slipping scheme for translation of bad-sector, with an example. **3M**

5B. What is Access-Matrix ? Illustrate its concept with four domains and four objects. Explain Global table implementation of Access Matrix. **4M**

5C. Differentiate between clone() system call and fork() system call. List 4 flags used when clone() is invoked along with its meaning. **3M**

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