WALCHAND COLLEGE OF ENGINEERING, SANGLI.

(An Autonomous Institute)

MSE

Second Year B.Tech. (Computer Science and Engineering)

MID SEMESTER EXAMINATION MARCH-2018

OPERATING SYSTEM (3CS223)

Exam Seat Number: _____

Day, Date and Time: Thursday, 08/03/2018, 03.00pm to 04.30pm

Max Marks: **30**

IMP: Verify that you have received question paper with correct course, code, branch etc.

Instructions: i) All questions are compulsory. Writing question number is compulsory. The answers may not be assessed if question number is not written.

ii) Figures to the right of question text indicate full marks.

iii) Assume suitable data wherever necessary. Write the answers with neat handwriting.

iv) Only FX82 series non programmable Calculator is allowed.

Text on the right of marks indicates course outcomes (only for faculty use).

			Marks	
Q1	A)	Consider a scenario, where multiple processes need to schedule on a single CPU to achieve maximum system performance. If following pairs of scheduling criteria are used in the scenario, identify the conflicts in certain settings which affect the performance of the system. i. CPU utilization and response time. ii. Average turnaround time and maximum waiting time.	2	CO1
Q1	B)	State whether following statements are true or false. i) Multitasking is a kind of multiprogramming. ii) Multi-user system does not imply multiprogramming. iii) Response time is more predictable in preemptive system than in nonpreemptive system. iv) If parent process terminates, child continues its execution.	2	CO1

Q1	C)	Consider following program;
		`main ()`
		`{`
		`fork ();`
		`fork ();`
		`fork ();`
		`printf ("Hello");`
		`}`
		
		i) How many child processes are created after executing the above code?
		ii) How many times *Hello* will be printed?
			2	CO1

Q2	A)	Under what circumstances would a user prefer a time-sharing system, rather than a personal computer or single-user workstation?	4	CO1
Q2	B)	Differentiate the terms related to synchronization: semaphore, mutex,monitor and spinlock.	4	CO2
Q2	C)	Consider the following processes and their CPU burst time and find out average waiting time and average turnaround time using preemptive form of priority scheduling algorithm (Lower number represents higher priority)with the help of Gantt chart.	4	CO4

Process	Burst Time (mills.)	Priority	Arrival Time (mills)
P1	9	5	0
P2	1	3	1
P3	5	1	2
P4	7	2	3
P5	3	4	4
Total	28		

Q2	D)	Consider the processes P1, P2, P3 and P4 which is having burst time of 7, 20, 5 and 13 respectively for its execution into the CPU. System uses a multilevel feedback queue scheduling with three queues Q1, Q2, and Q3. Q1 and Q2 use round-robin algorithm with time quantum = 5, and 4 respectively. Q3 use first-come first-service algorithm. Find the average waiting time and average turnaround time for the processes?	

Q3	A)	Consider a given code snippet: *do{* *flag[i]=TRUE;* *turn=j;* *while(flag[j] && turn ==j);* *critical section;* *flag[i]=false;* *reminder section;* *}while(TRUE)* Analyze how process synchronization will be achieved for process A and B.	
Q3	B)	Formulate Reader-Writers Problem and design a solution using semaphore where: i) Multiple Reader Processes can enter into critical section. ii) If any single Writer process is in critical section, other process has to wait.	4