University of Sargodha
M. Sc. 2nd Term Exam 2017.

Subject: I. T   **Paper: Operating System (CMP-3611)**

Time Allowed: 2:30 Hour

Maximum Marks: 80

Objective Part   (Compulsory)

Q.NO.1 -Answer the following questions in 2-3 lines having 2 marks each   [16x2=32]

1. How to implement hold and wait which can ensure that a deadlock will not occur?
2. Difference between Long-term scheduler and Short-term scheduler
3. What is virtual memory?
4. What is the difference between microkernel and layered operating system structure?
5. Write down the name of the different Process State
6. How page fault frequency can be used as a method of thrashing
7. Difference between "progress" and "bounded time" in critical section.
8. Define the concept of dynamic linking?
9. What is difference between logical and physical address?
10. Page table can be placed either in CPU registers or main memory. What will be the criteria to place the page table in CPU registers?
11. What do you mean by a busy waiting semaphore or spinlock?
12. What is API
13. What are the Deadlock Characterization?
14. What is Dispatcher?
15. Define Processor Affinity
16. What are the two types of Multiprocessing

Subjective Part

Note: Attempt any four Questions. All carry equal marks   [12x4=48]

Q.No.2 Briefly explain the Deadlock Avoidance algorithms?

Q.No.3

Process	Burst	Arrival	Priority
P1	10	0	5
P2	5	1	4
P3	4	2	3
P4	1	3	2
P5	12	4	1

What are the average turnaround time and the average waiting time in the scheduler queue in milliseconds for this set of processes running on a system using each of the scheduling algorithms listed below? Show your work to get any or full points.

1. Priority Scheduling (preemptive).
2. Priority Scheduling (Preemptive & Non-Preemptive)

Q.No.4 What is mean by Race Condition? How it is important during inter-process communication? Explain your answer in context of critical sections.

Q.No.5 Explain interrupts. How the Interrupt are Handles.

b) What is thread. Explain advantages and disadvantages of the Multithreading?

Q.No.6 A disk with 1000 cylinders, numbers 0 to 999, compute the number of tracks the disk arm must move to satisfy all request in the disk queue. Assume the last request serviced was at track 345 and the head is moving towards track 0. The queue in FIFO order contains request for the following track: 123, 874, 692, 475, 105, 376. Perform the computation for the following scheduling algorithms:

1) FIFO   2) SSTF   3) SCAN

Q.No.7 This is a string of memory page references: 4, 3, 2, 1, 5, 1, 2, 3, 2, 3, 4, 5, 5, 5
Draw diagrams showing the frame usage at each memory references for each of the following page replacement algorithms. Also give the number of page faults generated by each algorithm FIFO, LRU, LFU. Assume the system uses pure demand paging and starts with no pages in real memory. There are three frames of real memory.