Continuous Assessment : CPXX100: Operating Systems : Thursday, 11th April, 2013

**Please write all your answers on the question sheets.**

**Q.1.** Which of the following statements are true? Answer by placing **T or F** (true or false) beside each statement

1. Only a subset of the machine instructions is available in kernel mode

2. Each type of CPU has its own Instruction Set

3. It is easier to program in machine language than in assembly language

4. The invention of transistors made much faster and smaller computers possible

5. iOS is a mainframe operating system

6. Windows 9 is the latest version of Windows OS.

7. Magnetic disk is a type of secondary storage

8. Cache is the fastest memory on a computer system

9. Multiprogramming is where many processes are executing on the CPU at the same time.

10. Interrupts provide a way to improve processor utilization.

11. A program is static whereas a process is dynamic

12. A blocked process can be allocated the CPU

13. A context switch is when a program becomes a process

14. The process control blocks of some processes are updated during a context switch.

15. Long-term scheduler determines which programs are admitted to the system for processing

16. A goal of scheduling algorithms is to maximise the process waiting time

17. Shortest-Remaining-Time-First (SRTF) is the preemptive form of Shortest-Job-First (SJF)

18. In RR (Round Robin) scheduling, the time quantum should be small with respect to the context-switch time.

**Q.2. Task Manager**

The three diagrams attached are the Applications, Processes and Performance tabs from the Task Manager at a particular time. The first Processes tab is in decreasing order of CPU usage. The second Processes tab is in decreasing order of Memory Usage.

A java infinite loop program, created in JCreator, is running. Note java.exe is the process that runs when you are running a java program.

Specify the following:

a. The applications that are running

b. The number of processes running

c. The amount of physical memory i.e. RAM

d. The amount of RAM in use

e. The process using the maximum amount of memory

f. The CPU usage.

g. Explain the CPU usage.

h. Explain why there are there are 8 boxes in the CPU Usage History in the Performance tab.

i. What do the contents of these 8 boxes tell you?

j. Suppose you now assign the java.exe process to CPU 0. Will the CPU usage change? Describe the changes you will see in the CPU Usage History and explain your answer.

Q.3. Non-Preemptive SJF (Shortest-Job-First) Scheduling

Note: assume here that there is a single CPU.

The following table shows the arrival and burst times of 4 processes:

Process Arrival Time Burst Time

P1 0 5

P2 2 3

P3 4 2

P4 6 2

Draw a Gantt chart for non-preemptive SJF scheduling algorithm.

Give the waiting time and turnaround time of each process and the average waiting time and average turnaround time.

Diagrams for Q.2.







