



Please answer the following questions:

Q1: Complete the following sentences: **(10 points)**

1. frees up space on hard disk drive by removing temporary and unused files.
2. groups the pieces of files together on hard disk drive to improve computer performance.
3. is a software program that allows your computer to communicate with an attached device.
4. is a file that contains a copy of the original factory-shipped software.
5. is software that usually runs silently in the background on your computer, collecting and sending information about your use of the computer.

Q2: State the possible solutions for the following Symptom: **(10 points)**

1. Codec error messages appear when certain audio files are played.
2. Some video files do not play.
3. A new device is not recognized as part of the system.
4. Web pages load slowly.
5. My Internet browser home page changed to something I did not want.
6. Unwanted pop-up advertisements display on my computer when connected to the Internet.
7. Wireless keyboard does not work or is not detected.
8. Optical mouse does not track cursor well.
9. Invalid system disk or Non-System disk or disk error message displays.
10. Remote sensor is not receiving a signal from the remote control (select models only).

Q3: Three computers use register windows with the following characteristics. Determine the window size and the total number of registers in each computer.

(10 points)

	Computer 1	Computer 2	Computer 3
Global registers	10	8	16
Local registers	10	8	16
Common registers	6	8	16
Number of windows	8	4	16

Q4: An array multiplier multiplies two 4-bits numbers using AND gates and binary adders. The propagation delay in each AND gate is 10ns and 30ns for the adder. (Hint: assume any missing data). **(20 points)**

- A. Design this array multiplier, showing how many AND gates and adders.
- B. If we consider this multiplier as a pipeline, how many segments you need, what is the total time pipeline will take to perform $A_i * B_i$ for $i= 1$ to 10 .
- C. What is the total time in a non-pipeline to perform same number of tasks.

Q5: The content of the top of a memory stack is 5320. The content of the stack pointer SP is 3560. A two-word call subroutine instruction is located in memory at address 1120 followed by the address field of 6720 at location 1121. What are the content of PC, SP, and the top of the stack: **(10 points)**

- A. Before the call instruction is fetched from memory?
- B. After the call instruction is executed?
- C. After the return from subroutine?

Q6: Show the contents of registers E,A,Q, and SC during the process of multiplication of two binary numbers, 00111 (multiplicand) and 00101 (multiplier). The signs are not included. **(15 points)**

Q7: How would you use the floating-point pipeline adder to calculate the inner-product of two vectors $A[a_1 a_2 \dots a_{100}]$ and $B [b_1 b_2 \dots b_{100}]$. Propose a method to add the remaining four partial sums to form the final sum. **(15 points)**

Good luck.

Dr. Abdelhameed Fawzy (12/6/2012)