SINGAPORE POLYTECHNIC
SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING
ET0023 OPERATING SYSTEMS

TUTORIAL 2 – Computer Systems Review

1. Draw and label the five components of the OS pyramid model
   Using the OS pyramid model, compare and contrast a typical Desktop Operating System (e.g. Windows XP or 7) against a typical Server Operating System (e.g. Windows Server 2008 R2).
2.

2. Explain the functions of each of the following hardware components of a CPU.
   (a) General registers
   (b) Program counter
   (c) Stack pointer
   (d) Program status word
   Using the 8086 (or any x86 or i32 processor), write down the associated name/register for each of the above components.

3. Using a flowchart, briefly describe the Instruction cycle of a CPU.
   Given that a processor has a 4-stage pipeline architecture, explain how this architecture improves the performance of the Processor.
   Give one example of an instruction when this pipeline will not be advantageous.

4. Explain the term API when used in Operating Systems.
   Give 2 examples of how APIs help in the development of software.
   Give 2 example of how APIs fail in the development of software for a computer system.
   Write short notes to explain your answer.

5. In order to answer the following questions, you will need to reference the following:
   MS-DOS on Wikipedia (http://en.wikipedia.org/wiki/Ms-dos)
   MS-DOS API on Wikipedia (http://en.wikipedia.org/wiki/MS-DOS_API)

   a) In your own words, write a paragraph about MS-DOS, giving highlights on its user type, Manufacture, user interface, and run-able hardware types.
   b) Is MS-DOS still in use today?
      How does MS-DOS compare with the CMD interface of Windows 7 ?
   c) Name a rival OSes, similar to MS-DOS that is still in use today. What is this OS primarily used for?
   d) Show one example of how the MS-DOS API can be used to output a character to the standard output of the system.
      Using this example, explain how an API can help in the development of system software.