Singapore Polytechnic
School of Electrical and Electronics Engineering
ET0104 Embedded Computer Systems DECC 3FT/4EO

Tutorial 1 Introduction to Embedded Systems

1. For a computer system indicate which bus or buses are being described.

   a) A unidirectional bus.
   b) Carries signals used to synchronize data transfer operations.
   c) The CPU uses this bus to select a specific memory location for data transfer.
   d) During a WRITE operation, this bus carries data from the CPU.
   e) The number of lines on this bus determines the maximum memory capacity.
   f) The number of lines on this bus determines the memory word size.

2. (a) "An embedded system does not use Graphical User Interface. Therefore they should not need to use powerful processors." Explain if this statement is true.

(b) In what way does increased processor power in desktops benefit embedded systems?

(c) How do the Intel line of microprocessors maintain compatibility and yet provide extra functions?

(d) What are some ways computers increase in performance.

3. Describe some differences in characteristics between desktop and embedded systems.

4. i) What are three general areas to consider in power saving design for embedded systems?
ii) In the area of power supply design, what are three factors to consider?

5. In many battery powered electronic projects, it is common to use a 9V battery coonected to a 7805 regulator. A typical project consumes 50 mA of current: what is the efficiency of the power supply? If now a switching power supply with 85% efficiency and a LDO regulator that needs only 0.5V between input and output voltage is used, what is the overall efficiency?

6. Compare and contrast the differences between using software loops and hardware for timing functions.