SINGAPORE POLYTECHNIC
SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING
ET0023 OPERATING SYSTEMS

TUTORIAL 1 – Introduction to Operating Systems

1. Operating Systems can be divided into different categories. For each of the categories, write one or two lines highlighting its characteristic, give a practical example of such an operating system and the area/system on which it is applied. Use the table below to support your answers:

OS Type	Characteristic	Example	Application
Single task			
Multi task			
Single User			
Multi User			
Real-time			
Embedded			
Distributed			

2. Explain the following terms using examples, when applied to operating systems
   a) Batch Processing
   b) Spooling
   c) Time Slice operations
   d) Multi-tasking

   Does the MS Windows 7 operating system support any (or all) of the above? How can you demonstrate such operations with Windows 7.

3. In the development and history of computers, there have been, so far, four generations of computer systems. Using a table, compare and contrast the generations using the following categories: Period, Build technology, Construction and Operating System type.

	1st Generation	2nd Generation	3rd Generation	4th Generation
Period				1980 – current
Build Tech				VLSI
Construction				Personal Computers & Workstations
OS Type				Multi-user, Multi-tasking

3. Examine the timeline of the MS Windows operating systems and write short notes (one or two lines) on each of the following. Include in your answer, the year the operating system was put into production:
   a) MS-DOS
   b) Windows 1
   c) Window 3
   d) Windows NT
   e) Windows XP
   f) Windows 7

4. You are given a microcontroller board (consists of ROM, RAM, Input and Output ports, Display and Keypad). You are asked to develop an operating system for the board that can control the temperature of an environment by controlling the air-flow and measurement of temperature.
   a) Suggest the type of operating system required for the board
   b) Give reasons for the choice of the operating system.
   c) What are the limitations of the operating system you have chosen.

   Your company has decided that they would like to expand the above microcontroller board to handle other control situations where the user can write their own programs (apps) and submit them to the board for execution and testing.
      d) Would you need to change your operating system? Why?
      e) What additional tasks must your operating system handle?
      f) What could you do to make the programming of the apps simpler for the users?

   In which way are Modern operating systems similar to the operating system you are proposing above?

5. Most Linux operating systems come in two flavours – a Desktop version and a Server version. Using a table, select one genre of Linux (choose either Red Hat, Debian, Ubuntu) and write down 3 similarities and 3 differences of the flavour. You may use any of the keywords below:
   Memory, Disk Space, Accessibility, Running of programs, Single/Multi user, Optimization, I/O operations, User interface, Configuration, Application programs