UNIVERSITY OF GHANA

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B.A/BSC. FIRST SEMESTER UNIVERSITY EXAMINATIONS:

2008/2009

COMPUTER SCIENCE

COMP 403: COMPUTER HARDWARE (3 CREDITS)

EXAMINER: B. S—K WIREDU

TIME ALLOWED: TWO AND HALF (2 1/2) HOURS

Answer All the Questions in Section A and any ONE (1) from section B.

**SECTION A 160 MARKS**

***Answer All the questions in this section.***

1. (a) "The power supply Unit (PSU) is not only one of the most important part in a personal computer, but it is unfortunately also the most overlooked". Discuss

110marks]

1. There are three main types of PSU in common use today for Personal Computers (PCs) Describe each type in detail stating their common and different features as well as the output voltages produced by each type.

[15marks]

1. Produce a table which compare and contrast the power supply unit for Desktop, Laptop/Notebook and Palm-top computer systems in terms of cost, size, output voltage and maintenance

[10 marks]

1. A business which is completely network dependent is currently experiencing serious power supply problems. All the fifteen PCs and the server on the Company's Local Area Network (LAN) take their power supply directly from the mains supplying 220v A.C. Recently, there has been regular power outages which sometimes lasts for several days, and frequent voltage fluctuations which seriously lead to loss of data, long break in business operations as a result of system unavailability. The Company is currently experiencing serious financial losses as a direct result of the power supply problems.

Advice the company on what remedial actions to take in order to ensure continued network and systems availability.

**[25marks]**

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**SECTION B 40 MARKS**

***Answer any ONE (1) Question from this section***

1. **(a) "The motherboard should be high on your list of priorities whether you are buying a PC, building your own system or upgrading your computer"**

**Discuss.** **[10 marks]**

1. **Explain why a motherboard may combine more than one type of bus and describe one example of typical bus combination for a modern machine.**

**[10marks]**

1. **Describe with the aid of appropriate diagrams giving ONE advantage, ONE disadvantage and ONE application example, TWO of the following types of multiprocessor interconnection networks for parallel processing..**
   1. **Butterfly switch**
   2. **Crossbar-switch matrix and**
   3. **Multi-bus**

**[20marks]**



**Michael Flynn in 1972 classified computers into the four groups SISD,**

**SIMD, MISD and MIMD. Using appropriate diagrams (where possible),**

**describe machines in each of the four categories above, stating clearly, which**

**class of machines are suited for:**

1. **General-purpose computers.**
2. **Special-purpose computers.**

**Also state with reasons which model is the most/least popular model applied in**

**commercial machines.** **[40marks]**

1. **(a)Differentiate between the use of vectored and non-vectored interrupts in a system employing interrupt-initiated Input/output (I/O).[10marks]**
2. **Describe a potential problem with the use of a non-vectored interrupt in**

**conjunction with certain I/O devices.** **[10marks]**

1. **Daisy-chaining and use of a priority encoder are two different methods for dealing with priority interrupts from I/O devices. Describe each of these methods. Include diagrams to show how devices are connected and include truth tables and gate-level circuitry to show the generation of appropriate**

**signals.** **[20marks]**

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