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**University Examinations 2015/2016**

FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

**CIT 3150: COMPUTER SYSTEMS ARCHITECTURE**

 **DATE: AUGUST 2016 TIME: 2HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30MARKS)**

1. Distinguish between computer architecture and computer organization. (2 Marks)
2. Identify the six layers of computer architecture. (3 Marks)
3. Explain how the use of transistors and integrated circuits led to the emergence of smaller, cheaper and more powerful computers. (5 Marks)
4. Describe the following terms as used in computer:
5. BIOS
6. Mother Board
7. Bit
8. Registers
9. Interpreter (5 Marks)
10. Describe different ways of classifying computer memory. (4 Marks)
11. Give the three common number system that are used in computing . (3 Marks)
12. Using an illustrative diagram as necessary, describe the characteristics and components of a computer architecture based on the von Neumann Model. (8 Marks)

**QUESTION TWO (20 MARKS)**

1. Outline the hierarchical organization of system memory and describe the factors that determine performance. (6 Marks)
2. Describe the principal of locality with regard to system memory. (6 Marks)
3. Describe the distinguishing characteristics of the following memory types. Memory types PROM, EPROM, DRAM, SRAM. (8 Marks)

**QUESTION THREE (20 MARKS)**

1. Using an appropriate illustrative diagram, outline the internal organization of the CPU. (10 Marks)
2. Discuss how the following factors affect the performance of the CPU:
3. Data bus width
4. Clock rate
5. Cache memory (6 marks)
6. Explain the following file organization methods and identify the most suitable media:
7. Sequential organization
8. Random organization (4 Marks)

**QUESTION FOUR (20 MARKS)**

1. Outline the internal organization of the hard disk using the terms cylinder, head, track and sector. (5 Marks)
2. Define the following disk performance terms:
3. Access time
4. Seek time
5. Rational delay
6. Transfer time
7. Latency (5 Marks)
8. Outline the steps involved in wring an block of data to the hard disk starting with the request from the application program up to the competition of the Wright. (5 Marks)
9. Explain how RAID hard disk technology is used for performance and reliability. (5 Marks)

**QUESTION FIVE (20 MARKS)**

1. Describe the instruction cycle including the support for interrupts. (6 Marks)
2. Outline the bus interconnection structure including the roles of address bus, data bus and the relevant control signals on the control bus. (5 Marks)
3. Describe how arbitration and timing is carried out to optimize bus performance. (4 Marks)
4. Outline five factors that have made the Peripheral Component Interface bus (PCI) a viable replacement for the ISA bus. (5 Marks)