CIT711 - Computer Fundamentals Examination

Instruction: Answer Question 1 and any other three questions

Time Allowed: 2 ¾ hours

**Question 1:**
   a. (i) Explain the concept of virtual memory and its benefits          *5 marks*
      (ii) Name the four categories of computer programming languages     *2 marks*
   b. (i) Explain the star topology for LAN networks and discuss its advantages and disadvantages.          *5 marks*
      (ii) Briefly describe the purpose of Electronic Data Interchange (EDI).     *2 marks*
   c. Describe the functions performed by anti-virus programs          *5 marks*
   d. Discuss the role of an Arithmetic Logic Unit (ALU) in a computer system. *6 marks*

**Question 2:**
   a. Explain the difference between random access memory (RAM) and sequential access memory.          *3 marks*
   b. Compare and contrast DDR3 and DDR4 memory technologies using the following yardsticks:
      - Cost
      - Compatibility
      - Maturity
      - Access speed/ bandwidth
      - Power consumption          *10 marks*
   c. What are the characteristics of a magnetic disk?          *2 marks*

**Question 3:**
   a. What protocol is commonly used to connect computers to the Internet?          *1 mark*
   b. Analyze the advantages and disadvantages of using a wireless LAN (WLAN) compared to a wired LAN          *8 mark*
   c. Design a WAN connectivity solution for a company with multiple branches located in different cities.          *6 marks*

**Question 4:**
   a. Why are magnetic tapes more suitable for archival storage or backup purposes? *2 marks*
   b. Propose a novel approach to improve data compression techniques for storage systems.          *6 marks*
   c. Design a storage solution for a large-scale data center that maximizes both performance and fault tolerance.          *8 marks*

**Question 5:**
   a. (i) What is computer security?          *2 marks*
      (ii) Explain the concept of privacy in the context of computer security     *2 marks*
   b. Describe *four* ways in which data loss or manipulation can occur in a computer system.          *8 marks*