PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY AND BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: **COMPUTING AND INFORMATION TECHNOLOGY**

COURSE CODE: **BSIT 206**

COURSE TITLE: **COMPUTER ORGANIZATION AND ARCHITECTURE**

CAMPUS: **ROYSAMBU**

EXAM DATE:

TIME:

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B.**
- Write only your **student number** on the answer booklet provided.

SECTION A

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(Answer ALL questions in this section)

Question 1:

a) Convert the following Number systems

i. 6410_{10} to ($?_8$) **[2Marks]**

ii. Convert 1216_{10} to ($?_2$) **[2Marks]**

iii. $A2B_{16}$ to ($?_{10}$) **[2Marks]**

b) Discuss the technological advancements and key features of the second generation of computers, providing relevant examples of computer systems from this era.

[4Marks]

SECTION B: (Answer any THREE (3) questions in this section)

Question 2:

a) Explain the types of buses typically found in modern computers and discuss how they facilitate communication between different components. **[3Marks]**

b) Discuss the key characteristics of a computer memory system and their impact on system performance. **[3Marks]**

c) Imagine you're tasked with assembling a computer system for a small business. Describe the essential components you would include and justify your choices

[4Marks]

Question 3:

a) You are tasked with optimizing the performance of a computer system used for video editing. Explain the three types of cache memory commonly found in modern computer architectures **[6Marks]**

b) Consider the diverse applications of Reduced Instruction Set Computers (RISC) architectures such as ARM, MIPS, and PowerPC. Using ARM architecture discuss

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its real-world applications across different domains

[4Marks]

Question 4:

a) You're tasked with designing a real-time embedded system that requires efficient handling of Input/Output (I/O) operations. Discuss the key components and characteristics of interrupt-driven I/O that you would consider incorporating into the system's architecture

[6Marks]

b) In the realm of computer systems, the terms "organization" and "architecture" often come up, each representing distinct yet interconnected aspects. Discuss the fundamental differences between computer organization and architecture.

[4Marks]

Question 5:

a) Consider the XOR gate (Exclusive OR) in combinational logic circuits. Discuss practical applications where XOR gates play a crucial role. **[4Marks]**

b) Imagine you are tasked with designing a high-performance processor for a gaming console. Discuss the stages of the Instruction Cycle and leverage Instruction Pipelining. **[6Marks]**

Question 6:

a) Combinational circuits encompass various types of logic gates and modules, each with distinct functionalities and applications. Discuss the different types of combinational circuits and provide examples of real-world applications where each type is employed. **[6Marks]**

b) you're leading a team in the development of a next-generation computer system that heavily relies on advanced DRAM technology. Discuss the organization of this advanced DRAM system

[4Marks]

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