



## MERU UNIVERSITY COLLEGE OF SCIENCE & TECHNOLOGY

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### University Examinations 2011/2012

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR  
OF BUSINESS INFORMATION TECHNOLOGY AND FIRST YEAR, SECOND  
SEMESTER FOR BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER  
SCIENCE

#### ICS 2101: COMPUTER ORGANIZATION

DATE: DECEMBER 2011

TIME: 2 HOURS

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

#### QUESTION ONE (30 MARKS)

- a. Explain the following concepts in Computer Architecture
  - i. Pipelining (4 Marks)
  - ii. Multiprocessing (2 Marks)
  - iii. Processor registers (2 Marks)
  - iv. Processor cache (2 Marks)
  - v. CPL (2 Marks)
- b. Consider a non-pipelined machine with 6 execution stages of lengths 80 ns, 80 ns, 90ns, 90 ns, 80 ns, 80 ns, 90 ns, 90 ns, 80 ns, and 80 ns,
  - i. Find the instruction latency on this machine (2 Marks)
  - ii. Calculate the time taken to executed 500 instructions (2 Marks)
- c. Discuss the Importance of Flynn's Taxonomy and Identify at the Classification of Computer System. (7 Marks)
- d. Explain the Von Neumann Computer Architecture with the help of a diagram (7 Marks)

#### QUESTION TWO (20 MARKS)

- a. The Bus architecture has a considerable influence on Performance with regard to through put and responses time, as such the component Layout is crucial. Describe the three computer bus subassemblies (6 Marks)
- b. Critically examine and elucidate the Three Management Approaches deployed in management of I/O. (9 Marks)
- c. Discuss the Following Concept in relation to Bus Architecture in computer systems

- i. Bus arbitration
- ii. Bus synchronization (5 Marks)

**QUESTION THREE (20 MARKS)**

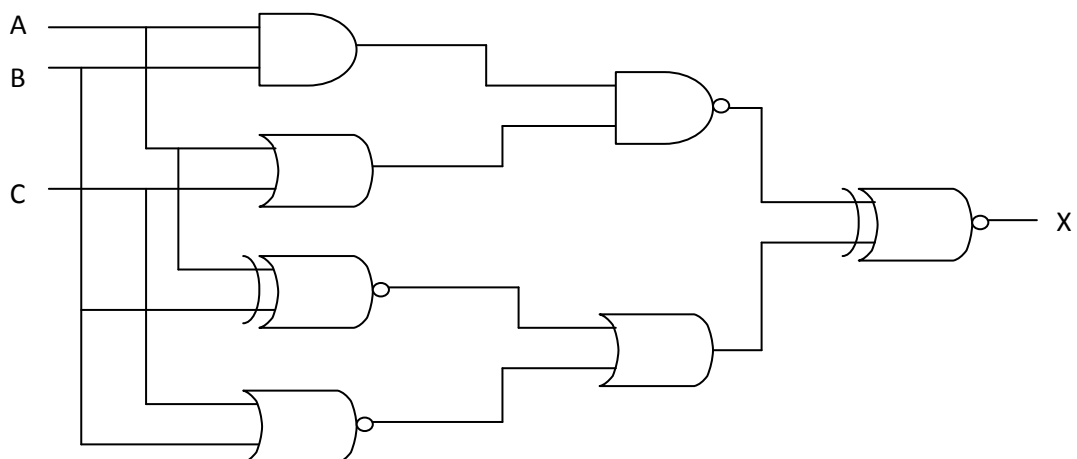
- a. By use of Diagram discuss memory Hierarchy and its Particular Characteristics (5 Marks)
- b. The Raid Technology has evolved over a Period of Time, Using the unique characteristics for Each Level Of Raid Identify where Level 1,2,5 would most be appropriate. (6 Marks)
- c. Discuss the Concept of Endians War and the Two main Protagonists (4 Marks)
- d. Differentiate between LRU and NRU Replacement Strategies as used as replacement Strategies. (5 Marks)

**QUESTION FOUR (20 MARKS)**

- a. Explain the steps to follow in designing an Input/ Output system (7 Marks)
- b. At the Heart of Computing is the Fetch Execution Cycle Describe the Steps involved the Execution of Instructions (7 Marks)
- c. The State of a process can be represented using a State Transition Diagram, Namely Dormant, Ready, Executing and Suspended. As a process moves from Running state to A suspended stated its must be serving an I/O requirement, which results to triggering interrupt requests. By illustrations, discuss the methods that are deployed in Handling of Interrupts. (6 Marks)

**QUESTION FIVE (20 MARKS)**

- a. Give the output X for the following logic gates and draw its truth Table (10 Marks)



- b. The evolution of computer architecture has predominantly tended towards CISC, but of late effort has been geared towards RISC architecture. Differentiate between the **two** architectures. (5 Marks)
- c. Discuss the **two** designs used in the Construction of Control Unit of the CPU. (5 Marks)