



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2018/2019

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

CIT 3150: COMPUTER SYSTEMS ARCHITECTURE

DATE: SEPTEMBER, 2019

TIME: 2 HOURS

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

QUESTION ONE (30 MARKS)

- a) Define the following terms; (4 Marks)
- (i) Computer system architecture
 - (ii) Computer organization
- b) Use a diagram to show the main components of a computer based on the Von Neumann architecture. (4 Marks)
- c) State the functions of each component in question 1b. (4 Marks)
- d) The Von Neumann machine make use of several registers. Briefly describe the use of the following registers; (6 Marks)
- (i) Program Counter
 - (ii) Instruction Register
 - (iii) Memory Address Register
- e) A computer system can be viewed as a layered system of different levels hierarchy and functionalities with a well- coordinated system architecture. Mention and discuss the six level. (6 Marks)
- f) Discuss the Fetch and the Execute cycle steps of a computer program cycle. Use the following diagram to show your understanding on the program execution. Explain the six steps as shown in the example given. (6 Marks)

QUESTION TWO (20 MARKS)

- a) Compare and contrast the Cache memory and the internal main memory. (4 Marks)
- b) Discuss the following terms; (4 Marks)
 - (i) Bus structure

- (ii) The Bus protocol
- c) At the very basic level, a computer system is a device consisting of three components. Mention and discuss these three components. (6 Marks)
- d) A Mr. Jones, a 1st year student in Meru University intends to buy a computer that he could use while in the University as a tool while in the university as well in the hostels. Kindly advise him on the kind and type of a computer system he could buy. Give him the full specification of a good computer. (6 Marks)

QUESTION THREE (20 MARKS)

- a) Draw and explain the generic model of I/O module. (6 Marks)
- b) Explain the I/O functions (4 Marks)
- c) Compare and contrast the 1960 computers and 2018 computers (6 Marks)
- d) Discuss the memory Hierarchy on a computer system. Draw a diagram to illustrate your answer. (4 Marks)

QUESTION FOUR (20 MARKS)

- a) Discuss at least five operating system services. (6 Marks)
- b) Discuss the five state process model of the operating system. Draw the diagram to illustrate your answer. (4 Marks)
- c) Discuss the instruction cycle with an interrupt. (4 Marks)
- d) Compare and contrast SRAM and DRAM (6 Marks)

QUESTION FIVE (20 MARKS)

- a) Draw and discuss the CPU internal structure. (6 Marks)
- b) State and explain three types of ROM (4 Marks)
- c) In reference to instruction addressing modes, discuss the following modes and give at least one example of each. (6 Marks)
- (i) Immediate
 - (ii) Direct
- d) Compare and contrast serial and parallel data transfer. (4 Marks)