



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

SMA 190: INTRODUCTION TO COMPUTER SYSTEMS

DATE: 30/4/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- (a) (i) Define the terms computer system. (2 marks)
- (ii) Using a suitable diagram, explain the various internal components of a computer system. (6 marks)
- (iii) Describe the two broad types of computer software, giving an example of each. (4 marks)
- (b) (i) State what you understand by the operating system (OS). (2 marks)
- (ii) Describe any three functions performed by an OS. (3 marks)
- (iii) Outline any three characteristics of an OS. (3 marks)
- (c) (i) Define the term number system. (1 mark)
- (ii) Explain the structure of the positional number system representation. (2 marks)
- (ii) Provide solutions to the following number conversions:
1. $(1000111)_2$ to decimal (1 mark)
 2. $(451)_8$ to binary (2 marks)
 3. $(45)_{10}$ to binary (2 marks)
 4. $(10101)_2$ to hexadecimal (2 marks)

QUESTION TWO (20 MARKS)

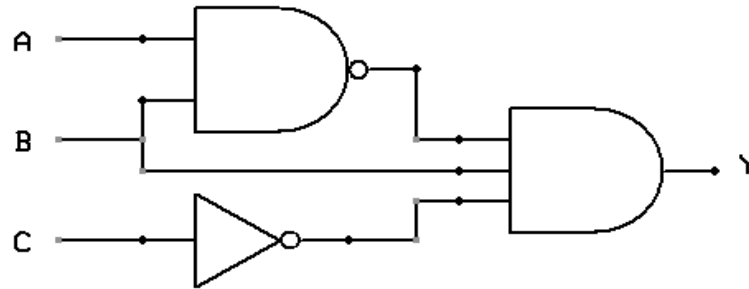
- (a) Describe three functions performed by computer hardware, giving an example of a device used to perform each of the functions. (6 marks)
- (b)
 - (i) Define the term processor as used in computer systems. (2 marks)
 - (ii) With the use of an appropriate diagram, describe the components of the CPU. (6 marks)
- (c)
 - (i) State what you understand by an instruction cycle. (2 marks)
 - (ii) Outline the main steps followed in an instruction cycle. (4 marks)

QUESTION THREE (20 MARKS)

- (a)
 - (i) Define the term memory as used in computing. (2 marks)
 - (ii) Distinguish volatile from non-volatile memory, giving an example of each. (4 marks)
 - (iii) Differentiate between primary and secondary memory, giving two example of each type. (6 marks)
- (b)
 - (i) Using a suitable diagram, explain the memory hierarchy of a computer system. (6 marks)
 - (ii) State the units of measurement of:
 - 1. processor speed
 - 2. memory size (2 marks)

QUESTION FOUR (20 MARKS)

- (a)
 - (i) Using suitable logic diagrams, explain the meanings of the AND ,the OR and the NOT logical operators used in computing. (6 marks)
 - (ii) Draw a logic diagram and provide the truth table corresponding to the Boolean expressions: $A'B + (B+C)'$ (6 marks)
 - (iii) Give the Boolean Expression of the output Y.



(3 marks)

- (a) Outline five generations of computer systems stating the technology used in each of the generations. (5 marks)
- (b) (i) Define the terms Artificial Intelligence. (2 marks)
- (ii) Describe the following terms commonly used in Artificial Intelligence giving an example of an application area of each:
1. Voice recognition
 2. Natural Language Processing
 3. Robotics
 4. Expert systems
- (8 marks)

QUESTION FIVE (20 MARKS)

- (a) (i) Define the terms social media. (2 marks)
- (ii) Outline four ways in which social media is currently helping organizations in their day-to-day operations. (4 marks)
- (iii) Name any four types of social media tools used today. (4 marks)
- (b) State the functions performed by the following internet applications, giving an example of each one of the applications:
- (i) browser
 - (ii) search engine (4 marks)
- (c) (i) State what you understand by the terms computer networks. (2 marks)
- (ii) Name at least four uses of a computer network. (4 marks)