



**TECHNICAL UNIVERSITY OF KENYA**

**FACULTY OF APPLIED SCIENCES AND TECHNOLOGY**

**SCHOOL OF COMPUTING & INFORMATION TECHNOLOGY**

**END OF SEMESTER DECEMBER 2016 EXAMINATION SERIES**

**FIRST SEMESTER EXAMINATIONS 2016/2017**

**FIRST YEAR EXAMINATION FOR THE DEGREE OF**

**BACHELOR OF TECHNOLOGY IN COMPUTER TECHNOLOGY**

**BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY**

**BACHELOR OF TECHNOLOGY IN COMMUNICATION AND COMPUTER**

**NETWORKS**

**ECSI 1105 /ECII 1105/ECCCI 1105: INTRODUCTION TO COMPUTER  
TECHNOLOGIES**

**Time: 2 Hours**

**December 2016**

---

**Instructions to candidates:**

This paper consists of FIVE Questions.

Answer Question ONE [30 Marks] and any other TWO Questions [20 Marks Each].

Write your college number on the answer sheet.

This paper consists of 3 printed pages

---

**Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**

---

© December 2016 The Technical University of Kenya Examinations

**QUESTION ONE (30 MARKS) COMPULSORY**

- a) Describe the differences between the digital computer and the analog computer  
(2 marks)
- b) Describe the function and give application areas where the following types of computer peripheral devices are used
- Magnetic Ink Character Reader (MICR)
  - Modems
  - Kimball Tag (3 marks)
- c) Draw a labeled functional block diagram of a computer system (3 marks)
- d) With reference to (b) above, describe the function of the following
- Control Unit
  - Arithmetic and Logic Unit (8 marks)
- e) Describe five advantages of transmitting data in digital format over analog format (5 marks)
- f) Draw a block diagram of a data transmission model and explain the function of each block (3marks)
- g) Describe the function of registers in a computer system (2 marks)
- h) With the aid of a diagram describe the machine cycle and explain its significance in a computer system (4 marks)

**QUESTION TWO (20 MARKS)**

- a) Describe the following types of memory and give two examples of each
- Read Only Memory
  - Random Access Memory
  - Secondary Memory (9 marks)
- b) Describe the performance advantage of including Cache memory in a computer system (3 marks)
- c) Describe the two major classifications of computer software and give two examples of each (8 marks)

**QUESTION THREE (20 MARKS)**

- a) Computer systems have evolved over the years to the current modern designs of today. Compare the characteristics of the third, fourth and fifth generation computers. (9 marks)
- b) Describe the contribution of the following scientists in the development of the computer system
- Charles Babbage
  - Alan Turing
  - Mauchly and Eckert (6 marks)
- c) Describe the difference between a supercomputer and a mainframe computer (2 marks)
- d) Explain three hardware and three software desirable characteristics when selecting a computer system (3marks)

**QUESTION FOUR (20 MARKS)**

- a) Describe the components of an information system (5marks)
- b) Describe the application areas where the following information systems are used in an organization.
- Transaction Processing Systems
  - Management Information Systems
  - Expert Systems (9marks)
- c) Describe the components of a Decision Support System (DSS) and describe how it supports decision making in organizations. (6marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain why the binary number system is commonly used in digital electronics (2 marks)
- b) Determine the largest decimal value that can be represented by a 10-bit number (2 marks)
- c) Convert each of the following BCD numbers to equivalent decimal
- (i) 1001001110110011 (ii) 1000010011110011 (4 marks)
- d) Convert each of the following numbers to binary equivalent
- e)  $5EC.67_{16}$  (ii)  $362.45_{10}$  (iii) 426.25 (6 marks)
- f) Convert each of the following numbers to its octal equivalent
- (i)  $3FD6.4B_{16}$  (ii)  $347.87_{10}$  (iii)  $1110100110011001_2$  (6 marks)