



Vavuniya Campus of the University of Jaffna

First Examination in Information and

Communication Technology - 2017

First Semester - September/October 2018

ICT1122 Fundamentals of Computer Systems

Answer Four Questions Only

Time Allowed : **Two** hours

1. (a) Describe each of the following terms in the context of computer systems:
 - i. Processor
 - ii. Information
 - iii. Memory
 - iv. Program [20%]
- (b) List down and describe the activities involved in data processing by a computer. [24%]
- (c) State *four* **disadvantages** of **first generation computers**. [16%]
- (d) Distinguish between **analog** and **digital** computers. [15%]
- (e) Briefly describe *five* real world environments where computers are playing crucial role. [25%]

2. (a) List down and describe the purpose of the *four* subsystems of the **Central Processing Unit (CPU)**. [20%]
- (b) Briefly describe the use of **cache memory** in a computer system. [20%]
- (c) State the purpose of each of the following **CPU registers**:
- i. Program Counter (PC)
 - ii. Instruction Registers (IR)
 - iii. Memory Address Registers (MAR)
 - iv. Memory Data Registers (MDR) [20%]
- (d) Briefly describe the *four* activities involved in a **machine cycle** of a computer system. [20%]
- (e) Illustrate the **memory read** and **memory write** operations with the aid of a diagram. [20%]
3. (a) Perform the following **base conversions**, showing all steps.
- i. Convert the decimal number 250_{10} into its equivalent **Binary, Octal** and **Hexadecimal** numbers. [15%]
 - ii. Convert the binary number 110011011110_2 into its equivalent **Octal** and **Hexadecimal** numbers. [10%]
 - iii. Convert the decimal fraction 35.1825_{10} into its equivalent **binary** fraction. [10%]
- (b) Evaluate each of the following binary arithmetic operations, showing all the steps:
- i. $1010111_2 + 100101_2$
 - ii. $11101111_2 - 1001111_2$
 - iii. $11101011_2 * 101_2$
 - iv. $110101011_2 / 110_2$ [20%]
- (c) Evaluate $30_{10} - 21_{10}$ using **Two's complement** method with 8 bits. [15%]
- (d) Represent the decimal number 7463_{10} in **BCD** form. [15%]
- (e) List *three* **disadvantages** of sign-magnitude representation. [15%]

4. (a) Compare and contrast between **RAM** and **ROM**. [20%]
- (b) List down *four* **advantages** and *four* **disadvantages** of magnetic tapes. [20%]
- (c) State the purpose of the following **input** and **output** devices:
- i. Keyboard
 - ii. Pointing devices
 - iii. Scanning devices
 - iv. Display monitors
 - v. Printers [25%]
- (d) Briefly describe each of the following with regard to computer software:
- i. System Software
 - ii. Application Software [20%]
- (e) List the three types of language translators and describe the functionality of each of them. [15%]
5. (a) List down and describe the *five* major functions of **operating system**. [25%]
- (b) Briefly describe why Windows operating system is one of the most popular operating system. [20%]
- (c) Describe each of the following types of computer networks:
- i. LAN
 - ii. WAN
 - iii. MAN
 - iv. Internet
 - v. Intranet [25%]
- (d) List down *five* **advantages** of computer networks. [15%]
- (e) Describe the purpose of the following with regard to Internet:
- i. Web browser
 - ii. Web Server [15%]