

# University of Ruhuna - Faculty of Technology

Bachelor of Information & Communication Technology

Level 1 (Semester 1) Examination - October 2018

Department: Information & Communication Technology

Time: 2 ½ hours

Course Unit: ICT1113 (Essentials of ICT)

Answer all five (5) questions

1)

a)

- i) Define a computer.
- ii) State the key technological developments of first and fourth generations of computers .  
Write down three (3) differences of the computers used in the above two generations.

b)

- i) Name two (2) types of connections used to connect a monitor to a computer.
- ii) Name two (2) factors used to describe the costs associated with a printer.
- iii) Briefly explain the two (2) basic printer types and give an example for each type.

c)

- i) Name the three (3) categories of storage devices according to the physical type.
- ii) Write down the meaning of the concept "Locality of Reference".
- iii) Briefly explain the behavior of capacity, cost per bit and speed in the memory hierarchy by giving an example for each.

2)

a)

- i) State the three (3) key characteristics of Von Neumann Architecture.
- ii) Write down the difference between inputs in special-purpose and general-purpose configuration of a computer.

b)

- i) Name two (2) types of registers in the CPU.
- ii) Assume that the data bus of a computer is 16 bits wide and each instruction is 64 bits long.  
Calculate number of times processor must access memory module during each instruction cycle to fetch the instruction.
- iii) Briefly explain three (3) main types of buses in the system bus.

c)

- i) Write down the meaning of a cross-platform application.
- ii) State five (5) main functions of an operating system.
- iii) Briefly explain two (2) types of application software in terms of the mode which they are being used.

3)

a)

- i) Write down two (2) types of protocols which governs the information flow of packets in the internet.
- ii) State the duties of a client machine and a server machine in client-server architecture.
- iii) "Internet is a packet switching network". Explain what happens in a packet switching network.

b)

- i) Briefly state the process happening in a modem.
- ii) Write down two (2) advantages and two disadvantages of e-mails.
- iii) Briefly explain the process performed by a search engine.

c)

- i) Computers get slow when it does not have enough space. Name three (3) ways that can be used to re-capture the space in a computer.
- ii) Write two (2) troubleshooting steps (except rebooting) for each of the following situations.
  - Cannot connect to the internet with a network cable
  - A program is not responding
  - Keyboard is not working

4)

a)

- i) Name three (3) types of switching techniques.
- ii) Briefly explain synchronous and asynchronous data transmission modes.

b)

- i) Name three (3) types of network topologies.
- ii) Write down how data transfers within each of the topology you mentioned in 4) b) ii).
- iii) Write down differences of LAN (Local Area Network), WAN (Wide Area Network) and MAN (Metropolitan Area Network) network types according to the geographical area covered, bandwidth and speed.

c)

- i) State the range of values that can be represented with  $n$  bits in the Unsigned Binary Code.
- ii) Write down an advantage and a disadvantage of unsigned binary notation.
- iii) Calculate the following using five-bit two's complement method.

- $(+3) + (+5)$
- $(-3) + (-5)$
- $(+3) + (-5)$
- $(-3) + (+5)$

5)

a)

- i) List the five (5) disciplines related to the computer industry, defined by the Computer Society of Sri Lanka (CSSL).
- ii) Write down the primary focus of ICT/IT degrees according to the CSSL.

b)

- i) Name the three (3) key security concepts in the CIA triad.
- ii) Give an example which can be considered as high security impact for each of the concept you wrote in 5) b) i).
- iii) Write down four (4) challenges in implementing computer security.

c)

- i) State the main difference between a computer worm and a computer virus.
- ii) Write down who is an ethical hacker.
- iii) "A 14 years old student who has being accused for hacking a server of a multi-national company has been released without any serious punishment since he is a minor and accepted his wrong doing." Explain whether you agree or disagree with the decision made.