

**University of Ruhuna- Faculty of Technology**  
**Bachelor of Information and Communication Technology Honors Degree**  
**Level 1 (Semester I) Examination, June/July 2023**  
**Academic year 2021/2022**

**Course Unit: ICT1112, Essentials of ICT and Computer Hardware (Written)**

**Duration: 02 hours**

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This question paper contains 05 pages including this instruction page.

**IMPORTANT INSTRUCTIONS:**

1. The medium of this examination is English.
2. This is a closed book examination.
3. This Examination consists of **four (04)** questions that are given equal marks.
4. You must answer **all four (04)** questions in this examination.
5. You are not allowed to use non programmable calculators.

1.

Read the following case study and answer the given questions.

*Creative Software* is a leading Software company in Sri Lanka who provides high quality and cost-effective software solutions for local and foreign clients. They effectively manage distributed software development across geographies and time-zones. Communication, transparency and frequent iterative deliveries avoid risks such as cost overruns or delivery delays and enables clients to continuously measure the progress and project quality. A broad spectrum of enterprise infrastructure including data servers, networks, databases and specialized applications such as enterprise search services, payroll systems have been managed by *Creative Software*. Business continuity is ensured by their managed services framework and technology advances are also aligned by the managed services. Their centralized server is operated with latest Microsoft Operating system which enables convenient use. Various cross platform software packages have been deployed according to the unique requirements provided by their clients. Technical support team ensures end users are provided timely assistance to resolve software and IT infrastructure issues.

- a. "Only application software is used in implementation of various software projects in Creative Software." Explain whether you agree or disagree with the given statement.
- b. Assume that the management team decides to install Linux operating system on their centralized server instead of current latest Microsoft Windows Operating System. Write down **three (03)** differences between Linux and Windows operating systems.
- c. Creative Software implements various application software that follows 'Batch mode'. Describe the meaning of 'Batch mode' providing a suitable example in creative software.
- d. Identify **two (02)** primary purposes of Microsoft Windows Operating System.
- e. Identify the operating system type of centralized server in Creative Software when it is operated with Linux. Write down **two (02)** reasons for your answer.
- f. Explain how Creative Software could support to deploy various cross platform applications.
- g. Creative software team is working on developing an E commerce site for client who is established in UK (United Kingdom). Describe **three (03)** features need to be catered in the development of E commerce site.

2.

a.

- i. Define a 'Computer Network'
- ii. Identify main elements of a communication system.
- iii. Simplex, half duplex and Full duplex are the main three data transmission modes used in communication systems. Compare Half duplex and Full Duplex using **two (02)** parameters. State a suitable example for each mode.

b. The physical topology of a network refers to the configuration of cables, computers and other peripherals. Hybrid topology is a mix of two or more topologies. Single large network can be obtained by connecting number of wired or wireless networks as well. There are no any restrictions to use specific topologies to build a hybrid topology. The following figure 1 shows an example of a hybrid network topology which combines wired and a wireless network.

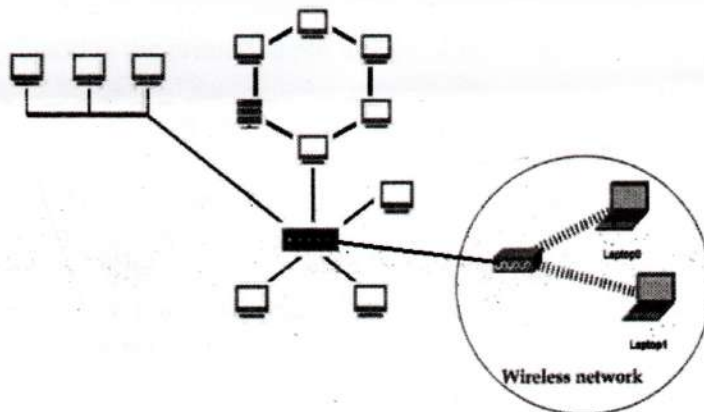


Figure 1

- i. List **three (03)** network topology types available in the network.
- ii. Write down **two (02)** advantages and **two (02)** disadvantages of 3 topologies found in the network.
- iii. Suggest a suitable data transmission media that can be used for wired and wireless networks.



- iv. 'Digital transmission is preferred over analog transmission.' Explain whether you agree or disagree with this statement.
  - v. A multinational company wants to have their data in a centralized location which enables 24/7 availability. Based on the component role what is the suitable network classification for the company? Describe why they should select it.
  - vi. Briefly describe main **three (03)** drawbacks the company has to face on their selected network architecture.
3. The CPU is the principal part of any digital computer system. It constitutes the physical heart of the entire computer system.
- a.
    - i. State main components of CPU.
    - ii. Describe **four (04)** main operations of the CPU.
    - iii. Sketch and name components of a diagram of internal CPU structure.
    - iv. Briefly describe the fetch part of instruction cycle.
  - b. Key board is the primary input device of the computer.
    - i. Name **three (03)** modifier keys of a modern computer.
    - ii. 'There is a theoretical potential to replace keyboards entirely' Justify this statement.
    - iii. Write **four (04)** steps that can be taken when your keyboard is not working.
  - c.
    - i. Describe **three (03)** key security objectives.
    - ii. Differentiate authorization and authentication by providing suitable examples.
    - iii. Describe how you can protect email against malicious code.

4.

a.

- i. Explain why do computers use the binary system instead of the decimal system.
- ii. Represent  $5403_{10}$  in positional notation
- iii. Convert  $731_{10}$  to hexadecimal
- iv. Convert the fraction numbers given below into decimal numbers. Show all the steps you follow.
  - $1011.11_2$
  - $134.51_8$
- v. Use 2's compliment method to calculate the following using 8-bit representation.  
(-51-30)
- vi. List **two (02)** advantages and **two (02)** disadvantages of unsigned notation.

b.

- i. Write **three (03)** advantages of the Linux operating system over other operating systems.
- ii. Briefly explain the key benefits of Linux for programming languages.
- iii. Write **three (03)** Linux commands to create files.
- iv. Write down the Linux command to see the current working directory.
- v. Write down the main purpose of using **chmod** command in Linux.
- vi. **mv** command is used for **two (02)** purposes of Linux. Explain these two purposes.

.....End of the paper.....