**FACULTY OF ENGINEERING, DESIGN AND TECHNOLOGY**

DEPARTMENT OF COMPUTING AND TECHNOLOGY

ADVENT 2024 SEMESTER EXAMINATION

PROGRAM: *BACHELOR OF SCIENCE IN ELECTRONICS AND COMMUNICATION SCIENCE*

YEAR: 1 SEMESTER: 1

COURSE CODE: *ECE1101*

COURSE NAME: *ICT PRINCIPALS*

EXAMINATION TYPE: *FULLY THEORY*

EXAMINATION DATE: DECEMBER 2024

TIME ALLOWED: *3 HOURS*

**Examination Instructions**

1. The general Uganda Christian University examination guidelines and academic & financial policies apply to this examination. Violating any of the policies by the student automatically makes this examination attempt void, even if you have completed and submitted the answer booklet.
2. This exam consists of two sections, i.e.,
   1. Section A (*40 Marks*) Attempt only **TWO (2)** questions from this section; every question carries 20 marks.
   2. Section B (*60 Marks*) Attempt only **THREE (3)** questions from this section; every question carries 20 marks.
3. Answers to every question should start on a new paper within the examination answer booklet.
4. Uganda Christian University or its officials reserve the right of admission or disqualification from this exam.

**SECTION A [40 MARKS]** (*Answer any two questions from this section*)

**Question One (20 Marks)**

(a). Define a communication system. [***2 Marks]***

1. With the help of an illustration explain the components of a communication system.

[***5 Marks]***.

1. Give advantages and disadvantages of a communication system [***3 Marks]***

(b). Define a "wireless communication channel." [***1 Marks***]

1. List three examples of non-wireless communication channels. [***4Marks]***
2. State the key features that distinguish the generation of computers. [***5 Marks]***

**Question Two (20 Marks)**

(a).Define the term "internet protocol”. [***1 Mark*** ]

1. List three common internet protocols and their primary functions. [***4 Marks*** ]
2. Explain the difference between a client-server network and a peer-to-peer network. [***5 Marks***]

(b). Imagine you are setting up a home network with multiple devices. What considerations would you take into account to ensure a secure and efficient network? [***5 Marks***]

1. If a small business wants to set up a network for file sharing among its employees, with 2 reasons, what type of network would you recommend? Justify your choice. [***5 Marks***]

**Question Three (20 Marks)**

1. What is memory hierarchy? [***2 Marks***]
2. Describe the concept of memory mapping and its purpose in computer systems. [***5 Marks]***
3. List the different levels of the memory hierarchy in a computer system, starting from the fastest and most expensive to the slowest and least expensive. [***3 Marks each***]

(b)Describe how the convergence of communications and IT has impacted modern information distribution systems. [***5 Marks each***]

1. Define "transmission mode." [***2 Marks]***
2. What does "half-duplex" mean in the context of transmission modes? [***3 Marks]***

**SECTION B [60 MARKS]** (*Answer any three questions from this section*)

**Question Four (20 Marks)**

(a)Define the instruction cycle as used in a computer system. [***2 Marks]***

1. Briefly explain the main phases of the instruction cycle. [***5 Marks***]
2. Explain the role of the instruction cycle in the performance of a CPU. [***5 Marks]***

(b). Create a flowchart that illustrates the instruction fetch and execute cycle, including all key components and their interactions. [***5 Marks]***

1. How does the CPU determine the address of the next instruction? [***3 Marks]***

**Question Five (20 Marks)**

(a). Applying your knowledge of emerging technologies:

1. How would you integrate IoT (Internet of Things) devices into an existing network infrastructure to enhance smart home automation? [***5 Marks]***
2. Discuss any five emerging technologies known to you. [***5 Marks]***

(b). What is network topology, and why is it important in network design? [***2Marks]***

1. State the role of any three or four primary devices used in computer networks. [***5 Marks***]
2. What measures can be taken to enhance security in various topologies? [***3 Marks]***

**Question Six (20 Marks)**

**(a)**Define a communication channelas used in communication systems. [***2 Marks]***

1. Why are communication channels crucial in information communication technology (ICT)? [*5 Marks]*
2. What are the main types of communication channels**? [*3 Marks]***

(b). Define the following;

1. Web Browser**.** [***2 Marks***]
2. URL**.** [***2 Marks*** ]
3. Client**.**[2 ***Marks***]
4. Server**.**[ 2 ***Marks***]
5. Bandwidth**.**[2 ***Marks***]

**Question Seven (20 Marks)**

(a)Applying your understanding of transmission modes: Given a scenario where a company needs to implement a communication system for remote employees, what parameters would you put into consideration before choosing wired or wireless transmission modes? [***5 Marks***]

1. Analyze the differences between wired and wireless transmission media in terms of bandwidth, latency, and interference. [***5 Marks]***

(b)What does the term "convergence of communications and IT" mean? [***2 Marks***]

1. Why is convergence important in modern information distribution systems? [***5 Marks]***
2. What are some practical examples of converged communication and IT systems? [***3 Marks***]

**~END OF EXAM QUESTIONS~**

MERRY CHRISTMAS & HAPPY NEW YEAR!