GRETSA UNIVERSITY - THIKA

UNIVERSITY EXAMINATIONS

JANUARY – APRIL 2026 SEMESTER

BACHELOR OF COMPUTER SCIENCE

COURSE CODE: BSCS 101

COURSE TITLE: FUNDAMENTALS OF COMPUTER SCIENCE

DATE: APRIL 2026 **TIME: 2 HOURS**

INSTRUCTIONS TO CANDIDATES

1. SECTION A IS **COMPULSORY.**
2. SECTION B: ANSWER ANY OTHER **TWO** QUESTIONS.
3. **DO NOT** WRITE ANYTHING ON THIS QUESTION PAPER AS IT WILL BE AN EXAM IRREGULARITY.
4. ALL ROUGH WORK SHOULD BE AT THE BACK OF YOUR ANSWER BOOKLET AND CROSSED OUT.

CAUTION: *All exam rooms are under CCTV surveillance during the examination period*

SECTION A: COMPULSORY (30 Marks)

a) Differentiate between a computer and computer science **[5 Marks]**

b) State and explain four data types used in programming. Give one example for each. **[5 Marks]**

c) Explain four ways in which computer science has transformed modern society (e.g., education, business, healthcare, communication). **[6 Marks]**

d) Convert $1AF2_{16}$ to: Show all working. **[4 Marks]**

i. Binary

ii. Decimal

e) Computational thinking is central to problem solving in computer science. Discuss the following techniques and briefly explain their importance: **[6 Marks]**

i. Decomposition

ii. Pattern recognition

iii. Abstraction

iv. Algorithm design

f) Distinguish between the following network types, giving one practical example for each **[4 Marks]**

i. Internet

ii. Intranet

iii. Extranet

SECTION B: ANSWER ANY TWO QUESTIONS

Question Two

a) State and explain four key features of a high-level programming language. **[6 Marks]**

b) Write a simple C++ program that declares two integer variables, assigns them values, and displays their sum on the screen. **[6 Marks]**

c) Differentiate between a variable and a data structure. Illustrate your answer with examples**.** **[4 Marks]**

d) Explain two types of control structures used in programming and give a code example for each **[4 Marks]**

Question three

a) Compare and contrast the following types of networks : **[6 Marks]**

i. LAN

ii. MAN

iii. WAN

b) Using a well-labeled diagram, describe the Ring Topology. Explain two advantages and two disadvantages **[4 Marks]**

c) Using a well labelled diagram discuss the ring topology, state its advantages and disadvantages **[4 Marks]**

d) Discuss the five generations of computers and highlight one major technological advancement in each generation. **[6 Marks]**

Question Four

a) Define computer security. **[2 Marks]**

b) Explain four common computer security threats and describe how each can be prevented. **[8 Marks]**

c) Discuss the importance of computer security in protecting data, systems, and networks. **[6 Marks]**

d) Briefly explain the difference between authentication and authorization. **[4 Marks]**

Question five

a) Discuss abstraction and modeling in computational thinking and explain their significance in solving complex problems. **[6 Marks]**

b) Using a well-labeled diagram, describe the main functional components of a computer system and explain the role of each component. **[8 Marks]**

c) Identify and explain three important considerations when writing and executing a simple computer program. **[6 Marks]**