

GAUHATI COMMERCE COLLEGE (AUTONOMOUS)

HOME ASSIGNMENTS

(For the Session- 2026)

BCA

Instructions: For each course, students must attempt **any ONE of the two questions**. Each question carries 10 marks.

Evaluation will be based on:

Conceptual understanding – 4 marks

Accuracy and completeness – 3 marks

Examples/programs/diagrams/calculations wherever applicable – 2 marks

Presentation and originality – 1 mark

1ST SEMESTER

Sl. No.	Subject	Option I	Option II
1	Introduction to C Programming	Explain the concept of functions in C . Discuss different types of functions and explain parameter passing and return values with suitable examples.	What are pointers in C ? Explain pointer declaration, initialization, pointer arithmetic and the use of pointers with suitable C programs.
2	Mathematics	What is the inverse of a matrix ? Explain the conditions for the existence of the inverse of a square matrix and derive the formula for finding the inverse using the adjoint method .	Find the inverse of a given 3×3 matrix using the Gauss-Jordan elimination method . Verify the result by showing that $AA^{-1} = I$ and $A^{-1}A = I$.
3	Communicative English	Explain the major elements of communication . Discuss the importance of each element in ensuring effective communication with suitable examples.	What are the different barriers to communication ? Explain the major types of barriers and suggest suitable measures to overcome them. Also distinguish between formal and informal language.
4	Office Automation	Explain the process of drafting a formal letter, application and report using word-processing software. Discuss important formatting features used in preparing professional documents.	Explain the use of spreadsheets and presentation software for academic and professional purposes. Discuss important spreadsheet features and the steps involved in creating an effective presentation.
5	Computer Fundamentals and ICT Hardware	Trace the evolution and generations of computers . Discuss the major types of computers and their applications in different fields.	Differentiate between system software and application software . Also explain different types of computer networks and their applications with suitable examples.
6	Environmental Studies	Explain the importance of natural resource conservation and sustainable use . Discuss the major environmental challenges associated with the overexploitation of natural resources.	Explain the structure and functions of an ecosystem , including energy flow and food webs. Discuss major threats to biodiversity and methods of biodiversity conservation.

3RD SEMESTER

Sl. No.	Subject	Option I	Option II
1	Computer Architecture and Organization	Explain the concept of memory hierarchy in a computer system. Discuss the different levels of memory and explain the need for memory hierarchy.	Explain instruction sets and addressing modes . Discuss different addressing modes with suitable examples and explain their role in instruction execution.
2	Database Management System	Explain the Entity-Relationship (ER) Model in detail. Discuss entities, attributes, relationships and cardinality, and design a suitable ER model for a college database.	What is normalization in DBMS? Explain 1NF, 2NF and 3NF with suitable examples and discuss the advantages of normalization.
3	Object Oriented Programming in Java	Explain the fundamental concepts of Object-Oriented Programming . Discuss encapsulation, inheritance, polymorphism and abstraction with suitable Java examples.	What is inheritance in Java ? Explain different types of inheritance and discuss the role of access modifiers in implementing inheritance.
4	Linux Environment	Trace the history and architecture of Linux . Explain the major components of Linux architecture and discuss the advantages of Linux as an operating system.	Explain important Linux commands, environment variables and file security mechanisms . Illustrate your answer with suitable commands and examples.
5	Yoga Education	Explain the major perspectives of Yoga . Discuss the physical, mental and social benefits of practising Yoga regularly.	Discuss the role of Yoga in health and wellness . Explain how regular Yoga practice can contribute to physical fitness, mental well-being and a balanced lifestyle.

5TH SEMESTER

Sl. No.	Subject	Option I	Option II
1	Operating System	Explain the different process states and the concepts of process creation and termination. Discuss process scheduling and explain the FCFS scheduling algorithm with a suitable example.	Explain Round Robin scheduling, swapping and segmentation . Also compare the FIFO and LRU page replacement algorithms with suitable examples.
2	Network Security and Cryptography	Explain the major goals of network security and discuss different types of network attacks. How can organizations protect their networks against such attacks?	Explain cryptography and encryption . Differentiate between symmetric-key and asymmetric-key cryptography and discuss their advantages, limitations and applications.
3	Design and Analysis of Algorithm	Explain the concept of time complexity and Big-O notation . Analyse the time complexity of Insertion Sort and Quick Sort in their best, average and worst cases.	Explain tree traversal algorithms . Discuss preorder, inorder and postorder traversal and analyse their time complexity with suitable examples.
4	Programming with C++	Explain the concepts of abstraction and encapsulation in C++. Discuss their importance in object-oriented programming with suitable examples.	Explain pointers in C++ . Discuss pointer declaration, initialization, pointer arithmetic and the use of pointers with arrays and functions with suitable examples.

Last date of submission: 5th October, 2026; *the mood of submission of Assignments shall be communicated separately by the respective Departments.*