

**Scheme of Examination for
Bridge Course(s) for MCA 2-Year Programme**

Course No.	Course	L	T	P	Internal	External	Total
MCA-BC-01	MCA Bridge Course – I	3	-	2	30 (Theory)	70 (Theory) 50 (Practical)	100 (Theory) 50 (Practical)
MCA-BC-02	MCA Bridge Course – II	3	-	2	30 (Theory)	70 (Theory) 50 (Practical)	100 (Theory) 50 (Practical)
	Total				60 (Theory)	140 (Theory) 100(Practical)	300

MCA-BC-01
MCA Bridge Course I

L - 3
T - 0
P - 2

Internal Marks- 30 (Theory)
External Marks- 70 (Theory)
External Marks- 50 (Practical)

Note:- Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Course Objectives: The main objective of the course is to bridge the gap between subjects studied by the BCA/Bachelor of CSE students and the BA/BSc/BCom students. The students taking this bridge course shall be taught in foundational mathematics, fundamental concepts of computers and C programming language.

Learning Outcomes: After successful completion of this bridge course, the students shall be able to:

- Understand basic programming skills in C language and develop simple computer programs in C.
- Appreciate the working of computer system and working of its components.
- Possess a background knowledge of mathematical structures used in computer science and computer applications.

Unit-I

Elements of C language: C character set, identifiers & keywords, data types: declaration & definition.

Operators: Arithmetic relational, logical, bitwise, unary, assignment and conditional operators & their hierarchy & associativity, Data input/output.

Control statements: Sequencing, Selection: if and switch statement; iteration, repetition: for, while, and do-while loop; break, continue, goto statement.

Unit-II

Functions in C language: Definition, prototype, passing parameters, recursion,

Data structure: arrays, structures, union, string, data files.

Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays.

C preprocessors

Unit-III

Computer Fundamentals: introduction, characteristics of computers, the evolution of computers, the computer's generations, basic computer organization, storage hierarchy, primary & secondary storage, input-output devices.

Computer Software: introduction, relationship between hardware and software, types of software, planning the computer program: purpose of program planning, algorithm, flowcharts, decision tables, pseudocodes, application software packages.

Data Communications and Computer Networks: Introduction, data transmission modes, data transmission speed, transmission media, digital and analog transmission, the internet, multimedia.

Unit-IV

Foundational Mathematics: Types of numbers and their properties, natural numbers, whole numbers, integers, real numbers, rational numbers, irrational numbers, complex numbers, imaginary numbers.

Set theory: Basic concept, set types, set operations, cardinality, and notation.

Group theory: Basic concept, subgroups, group axioms, subgroups, co-sets, normal subgroups, semigroups.

Graph theory: Directed and undirected graphs, chains, circuits, paths, cycles, connectivity, adjacency matrix.

References:

1. C Programming, Yashwant Kanitkar, Let us C, BPB Publications.
2. Pradeep k. Sinha & Priti Sinha, Computer Fundamentals, BPB Publications
3. Behrouz, Frozen, *Introduction to Data Communications and Networking*- Tata MC-Graw Hill.
4. Rajaraman V, Fundamentals of Computers, PHI
5. Seymour Lipschutz, Marc Lars Lipson, Discrete mathematics, McGraw-Hill international editions, Schaum's series.

MCA-BC-02
MCA Bridge Course II

L - 3
T - 0
P - 2

Internal Marks- 30(Theory)
External Marks- 70 (Theory)
External Marks- 50 (Practical)

Note:- Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Course Objectives: The main objective of the course is to bridge the gap between subjects studied by the BCA/Bachelor of CSE students and the BA/BSc/BCom students. The students taking this bridge course shall be taught topics in digital electronics, C++ programming language, and organisation of digital computer.

Learning Outcomes: After successful completion of this bridge course, the students shall be able to:

- Understand the concept of object orientation and basic programming skills in C++ language and develop simple computer programs in C++.
- Appreciate the working of computer system through its organisation in terms of components.
- Possess a background knowledge of Boolean mathematics and corresponding electronics.

Unit-I

Object oriented concept: Data abstraction, encapsulation, classes and objects modularity, hierarchy, typing, concurrency, object-oriented methodology: advantages and disadvantages of OO methodologies. aggregation, generalization and inheritance, abstract class, meta data, object diagram, dynamic model – events, states, scenarios, event traces, state diagram; functional model-data flow diagram, analysis, system design and object design.

Unit-II

C++ Programming: Data types, structures vs classes, static data and member function, constant parameters and destruction, dynamic objects, operator overloading, function overloading, abstract class, virtual class, inheritance, virtual functions, template functions & template classes, exception handling, I/O streams.

Unit-III

Digital Fundamentals: Information representation - number systems, codes, binary arithmetic operations; number systems - non positional number system, positional number system, number system conversion, fractional number conversion; computer codes - BCD code, EBCDIC code, ASCII, binary arithmetic - addition, subtraction, multiplication, division; binary logic - Boolean algebra, Boolean functions, truth table, simplification of Boolean functions, digital logic gates.

Unit-IV

Computer Organisation: Combinational logic - adders, subtractors, encoder, decoder, multiplexer, demultiplexer and comparators; processor organisation - machine instructions, instruction cycles, instruction formats and addressing modes, microprogramming concepts, microprocessor sequence;

sequential logic - flip flops, shift registers and counters; I/O organisation - I/O interface, interrupt structure, transfer of information between CPU, memory and I/O devices.

References:

1. Rumbaugh. J.et. al., Object oriented modeling and design, Prentice Hall of India 1998.
2. Stroustrup, B., The C++ programming language, Addison –Wesley1993.
3. Balaguruswami, object oriented programming in C++ : Tata McGraw
4. Pradeep k. Sinha & Priti Sinha, Computer Fundamentals, BPB Publications
5. Rajaraman V, Fundamentals of Computers, PHI
6. Mano. M. Morris Digital Logic & Computer systems Design, Prentice hall of India Pvt. Ltd., 2000.