TEACHING AND EXAMINATION SCHEME
Bachelor of Computer Applications - I Year
W.E.F. 2019-2020

	Paper Name (Theory)	Lec	Exam Hours	MARKS	
				Min	Max
bca-101	Cyber Security Technologies & Practices	3	3	18	50
bca-102	Computer Fundamentals	3	3	18	50
bca-103	Data Structure	3	3	18	50
bca-104	Programming in C	3	3	18	50
bca-105	Discrete Mathematics	3	3	18	50
bca-106	Multimedia Basics	3	3	18	50
			Total of Theory Marks		**300**

	Paper Name (Practical)	Pract Hours	Exam Hours	MARKS	
				Min	Max
bca-107	Data Structure Lab	3	3	18	50
bca-108	C Programming Lab	3	3	18	50
bca-109	Multimedia	3	3	18	50
			Total of Practical Marks		**150**

			Total of Theory & Practical Marks		**450**

SCHEME OF EXAMINATION
BACHELOR OF COMPUTER APPLICATIONS

Theory:

Part A:

1. 10 Question of 1.5 mark each – 15 marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part B:

1. 5 Questions of 3 marks each – 15 marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part C:

1. 3 Questions of 7+7+6 marks each – 20 marks.
2. There will be an internal choice in each question.
3. Answer should not exceed 400 words

Practical & Projects:

Practical exams shall be conducted by one internal and one external examiner of a batch of 40 students in a day.

Duration of Practical exam is 3 hours.

A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.

Practical of 50 marks distribution is as under:

a. 30 marks for practical examination exercise for 3 questions
b. 10 marks for Viva-voce
c. 10 marks for Laboratory Exercise File

Duration: 3 hours	Max Marks: 50

bca-101Cyber Security Technologies & Practices

Information securityconcepts, Overview: Background and current scenario, types of attacks, goals for security, E-commerce security, Computer forensics, steganography

Security threats and vulnerabilities, overview of security threats, weak/strong passwords, insecure network connections, malicious code, programming bugs, cybercrime and cyber terrorism, information warfare and surveillance, virus, Trojan, worms, botnet, ransomware, shells, backdoors

Security management practices, overview of security management, information classification process, security policy, risk management, security procedures and guidelines, business continuity and disaster recovery, ethics and best practices

Security laws and standards, security assurance, security laws, intellectual property rights, international standards, security audit

Access control and intrusion detection, overview of identification and authorization, overview of intrusion detection systems, intrusion detection systems and intrusion prevention systems

Server management and Firewalls, user management, overview of Firewalls, type of Firewalls

Wireless networks and security, components of wireless networks, security issues in wireless

Duration: 3 hours	Max Marks: 50

bca-102Computer Fundamentals

Introduction to Computer: Definition, Characteristics, Classification of Computers, Analog Computers, Digital Computers, Hybrid Computers, Classifications of computer on the basis of size and speed, different type of computers, generation of computers.

Computer keyboard, pointing devices, mouse, track ball, touch pad, joystick, touch – sensitive screens, pen – based systems, digitizer, data scanning devices, optical recognition systems, bar code readers, optical mark readers, optical scanners, drum scanners, hand scanner, flatbed scanner, web camera, game pad, digital camera.

Hard copy devices: Printer, impact printers, daisy wheel, dot matrix printer, line printer, chain printers, comb printers, non-impact printers, DeskJet, inkjet printers, laser printer, thermal transfer printer, barcode printers.

Computer Display: CRT, LCD, projection displays, plasma display panel, display standard, monochrome display adapter, HGA, CGA, EGA, VGA, MGA, SVGA, XGA, QVGA, SXGA, UXGA

Introduction to memory, classifications, random-access memory, volatile memory, non-volatile memory, flash memory, read-only memory, secondary memory, the cache memory, auxiliary storage memory, memory hierarchy, storage devise, magnetic tape, magnetic disk, floppy disk, hard disks, CD, DVD, magneto-optical.

Number system, binary, octal, hexadecimal, addition, subtraction, multiplications, computer code: BCD, ASCII, EBCDIC code, Excess-3 code, gray code, software, User interface, system software, programming software, application software logic gates and Boolean algebra representation and simplifications by kMap.

Computer Viruses: Introduction, history, types of computer viruses, classification of viruses ways to catch a computer virus, symptoms of a computer virus.

Application of computer: Desktop publishing, sports, design and manufacturing research and design, military, robotics, planning and management, marketing, medicine and health care, arts, communications, scientific, education.

Introduction of internet, history, IP, TCP and UDP, application protocol, world wide web, how the web works, web standards, website, overview, types of websites, electronic mail, internet, e-mail header, saved message file extension, messages and mailboxes, introduction to intranet, uses, advantages, disadvantages.

Introduction to data warehouse, components of a data warehouse, different methods of storing data in a data warehouse, advantages of using data warehouse

Duration: 3 hours	Max Marks: 50

bca-103Data Structure

Definitions of Data Structure and Algorithm – Time and Space complexity- Algorithm notations.

Merge sort, quick sort, dynamic programming
Control structures- Variables – Data types- Arrays- String processing – Sorting and Searching- Insertion-Selection-Binary Search- Linear Search

Binary tree- Representation – Traversing - Binary Search tree- Insertion deletion into a binary search tree

Graph- Representation of Graph- Shortest path – Operation on Graphs- Traversing a Graph

Duration: 3 hours	Max Marks: 50

bca-104Programming in C

Overview of C Language: History of C, Character set, C tokens, Identifiers, Keywords,Data types, Variables, Constants, Symbolic Constants , Operators in C, Hierarchy ofOperators, Expressions, Type Conversions and Library Functions.

Managing Input and Output Operation: Formatted and Unformatted I/O Functions,Decision making, branching and looping: Decision Making Statements - if Statement, if–else statement, nesting of if-else statements, else–if ladder, switch statement,?: operator

Looping - while, do-while, for loop, Nested loop, break, continue, and goto statements.Functions: Function Definition, prototyping, types of functions, passing arguments tofunctions, Nested Functions, Recursive functions.

Arrays: Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays,Multi-Dimensional Arrays - Passing arrays to functions. Strings: Declaring andInitializing strings, Operations on strings, Arrays of strings, passing strings to functions.Storage Classes - Automatic, External, Static and Register Variables

Structures-Declaring and Initializing, Nested structure, Array of Structure, PassingStructures to functions, Unions, typedef, enum, Bit fields. Pointers – Declarations,Pointer arithmetic, Pointers and functions, Call by value, Call by reference, Pointers andArrays, Arrays of Pointers, Pointers and Structures. Meaning of static and dynamicmemory allocation, Memory allocation functions.

Duration: 3 hours	Max Marks: 50

bca-105Discrete Mathematics

Sets: definition and types, set operations, partition of set, cardinality, recursive definition of set. Functions: concept, some special functions (polynomial, exponential & Logarithmic, absolute value, floor & ceiling, mod & div functions) properties of functions, cardinality of infinite set, countable and uncountable set, pigeon hole principle, composition of function

Relations: Boolean matrices, binary relation, adjacency matrix of relation, properties of relations, operations of relations, connectivity relation, transitive closure, Warshall Algorithm, equivalence relation, equivalence class

Proof Methods: Vacuous, trivial, direct, indirect by contrapositive and contradiction, constructive & non-constructive proof, counterexample. The division algorithm, divisibility properties (prime numbers & composite numbers) principle of mathematical induction, the second principle of mathematical induction, fundamental theorem of arithmetic. Algorithm correctness: partial correctness, loop invariant, testing the partial correctness of linear and binary search, bubble and selection sorting

Graph theory: Graphs, directed, undirected, simple, adjacency & incidence, degree of vertex, sub-graph, complete graph, cycle & wheel graph, bipartite & complete bipartite graph, weighed graph, union of simple graphs. Complete graph isomorphic graphs, path, cycles & circuits Euclerian& Hamiltonian graphs. Trees: spanning trees – Kruskal'sAlgo, finding spanning tree using depth first search, breadth first search, complexity of graph, minimum spanning tree.

Language of Logic: Proposition, compound proposition, conjunction, disjunction, implications, converse, invers and contrapositive, bi-conditional statements, tautology, contradiction, contingency, logical equivalence, quantifiers, arguments.

Duration: 3 hours	Max Marks: 50

bca-106Multimedia Basics

Introduction to Multimedia computer and its peripheral devices, communications and entertainment; framework for multimedia systems: Advantages of MM, system components and the user interface, MM platform, hardware software, commercial tools and standard.

Images and applications, image capture, compression, standards, audio compression and decompression, audio synthesis, MIDI, speech recognition and synthesis, video capturing, compression and decompression, digital video and image compression; jpeg image compression standards; mpeg motion video compression; DVI technology; time-based media representation and delivery

Developing Applications, methodology, design, multimedia object sharing multimedia and multimedia and the law

Application of Multimedia: Intelligent Multimedia system, training and education, kiosks, multimedia in office and home.

Photoshop: Fundamentals, Opening and Importing Images, Resolution, Models and Colour Spaces, Layers. Painting Pixels: The Painting Tools, Erasing, Fills, Type. Selection And Allied Operations: Marquee selection and cropping, Lasso Selection, Paths, Combining and Transforming Selections. Adjustments and Retouching: Tonal Adjustment, Colour Adjustments, Retouching By Hand. Effects and Filters: Blurring and Sharpening, Special Effects and Distortion, Layer Effects and Layer Styles.

Flash: Animation with Interacting, Basic Concepts, Drawing, Lines and Shapes, Strokes and Fill, Shapes and Brushes, Selection, Transformation and Reshaping, Importing Artwork and Manipulating Images. Animation: Animating One Frame at a Time, Motion Tweening , Symbols and Instances , Shape Tweening , Sound.

Actions: Buttons, Button action, Frame Action, Action and Movie Clip Symbols , Actions , Browsers and Networks , Beyond the Basic Actions. Flash CS 6: Interface Elements, Panels, Tools, Layer Folders, Accessibility, Video.