

TEACHING AND EXAMINATION SCHEME
Bachelor of Computer Applications - II Year
W.E.F. 2021 - 22

Paper Name (Theory)		Lec	Exam Hours	MARKS	
				Min	Max
bca-201	Software Engineering	3	3	18	50
bca-202	Python Programming	3	3	18	50
bca-203	Database Management Systems	3	3	18	50
bca-204	Java Programming	3	3	18	50
bca-205	C++ Programming for Object Oriented Systems	3	3	18	50
bca-206	Computer Graphics	3	3	18	50
Total of Theory Marks					300

Paper Name (Practical)		Pract Hours	Exam Hours	MARKS	
				Min	Max
bca-207	MS Access&Python Programming	3	3	18	50
bca-208	Java Programming	3	3	18	50
bca-209	C++ Programming & Computer Graphics	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
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bca-201Software Engineering

Software Process ,Software Process models: waterfall, incremental development, reuses oriented, Process activities;Coping with change, The rational Unified process. Introduction to Agile process

Requirements Engineering, Functional and non-functional requirements, The software requirements document, Requirements specification, Requirements engineering processes, Requirement elicitation and analysis, Requirements validation, Requirements management

Component-based software engineering, Components and component model, CBSE process, Component composition.

Design: Design concepts, Function oriented design, detailed design

Distributed Software engineering, Distributed system issues, Architectural patterns for distributed systems, Software as a service. Web application design and development

Planning a software Project, Process planning, Effort estimation, Project scheduling and staffing, Quality plan, Risk Management, Project monitoring plan.

Software Testing, Testing fundamentals, Black-box testing, White-box testing, Testing process

bca-202Python Programming

Introduction: History, Versions, Features, Advantages, Application areas.

Python Basics: IDLE, Editors, Keywords, Identifiers, Indents, Input Output Basic Syntax, Variable, Dynamic Typing, Data Types (Mutable and Immutable), Built-in Conversion Methods.

Operator: Arithmetic, Comparison, Logical, Identity, Membership.

Control Statements: Conditional (If , If- else, Elself, Nested if-else), Looping (While, For, Nested loops), Break, Continue, Pass.

Array: Introduction, Creation, Traverse, Insertion, Deletion, Search, Update.

String: Introduction, Types, Escape Sequences, Formatting, Operators, Built-in Methods (Capitalize, Upper, Lower, Title, Find, Count, Isalpha, Isdigit, Islower, Isupper), Basic Operations (Accessing, Updating, Concatenation).

List & Tuple: Introduction, Accessing, Operators, Built-in Methods (Len, Max, Min, Append, Insert, Remove, Pop, Reverse, Sort, List), Basic Operations (Updating, Delete, Concatenation, Indexing, Slicing).

Set: Introduction, Accessing, Built-in Methods (Add, Update, Clear, Copy, Discard, Remove), Operations (Union, Intersection, Difference).

Dictionary: (Single Dimensional) Introduction, Accessing, Updating, Deleting, Viewing values in dictionaries, Built-in Methods (Len, Max, Min, Pop, Clear, Items, Keys, Values, Update).

Function: Defining, Calling, Function Arguments (Required, Keyword, Default, Variable Length) Anonymous Functions, Global and Local Variables.

Modules: Introduction, Importing Module, Built-in Modules (Math, Statistics, Random).

Package: Creating, Installing, Importing Modules from the Package.

Errors & Exception: Error Types, Exception Handling - Introduction, Try, Except, Else, Finally.

File Input-Output: Opening and Closing files, Reading and Writing files.

bca-203Database Management Systems

Overview of DBMS: Basic DBMS terminology, DBA and his responsibilities, physical and logical data independence, architecture of DBMS, distributed databases, structure design and Client/server architecture.

Entity-Relationship Model, entity, entity set, attributes, tuples, domains, keys, super and candidate key, overview of hierarchical, network and relational models, comparison of network, hierarchical and relational models

Relational Model: Storage organization for relations, relational algebra, set operators, relational operators, decomposition of relation schemes, functional dependencies normalization up to BCNF.

Relational Query Language: DDL, DML, DCL, database integrity, domain integrity, entity integrity, referential integrity

MS-Access: Create a Table in MS Access -Data Types, Field Properties, Fieldsnames, types, properties, default values, format, caption, validationrules Data Entry Add record delete recode and edit text Sort, find/replace,filter/select, re-arrange columns, freeze columns. Edit a Tables- copy, delete, import, modify table structure find replace.

Setting up Relationships- Define relationships, add a relationship, set a rule for Referential Integrity, change the join type, delete a relationship, save relationship Queries & Filter –difference between queries and filter,filter using multiple fields AND,OR,advance filter Queries create Query with one table,fiend record with select query, find duplicate record with query,find unmatched record with query, run query,save and change query.

Introduction to Forms Types of Basic Forms: Columnar, Tabular, Datasheet, Main/Subforms, add headers and footers, add fields to form, add text to form use label option button, check box,combo box, list box Forms Wizard, Create Template.

Introduction to Reports,Types of Basic Reports: Single Column, Tabular Report Groups/Total, single table report multi table report preview report print report, Creating Reports and Labels, Wizard

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bca-204Java Programming

Introducing Data Types and Operators, Java's Primitive Types, Literals, Variables, operators, Type conversion in Assignments, Cast, Operator Precedence, Expressions.

Program Control Statements, Input characters from the Keyboard, if statement, Nested ifs, if-else-if Ladder, Switch Statement, Nested switch statements, for Loop, Enhanced for Loop, While Loop, do-while Loop, Use break, Use continue, Nested Loops.

Introduction to Classes, Objects and Methods, Class Fundamentals, Reference Variables and Assignment, Methods, Using Parameters, Constructors, Parameterized Constructors, The new operator.

More Data Types and Operators, Arrays, Multidimensional Arrays, Alternative Array Declaration Syntax, Assigning Array References, Using the Length Member, The Bitwise operators.

String Handling, String Fundamentals, The String Constructors, Three String-Related Language Features, The Length() Method, Obtaining the characters within a string, String comparison, using indexOf() and lastIndexOf(), Changing the case of characters within a string, String Buffer and String Builder.

Method Overloading, Overloading Constructors, Recursion

Inheritance, Inheritance Basics, Member Access and Inheritance, Constructors and Inheritance, Using super to Call, Super class constructors, Using super to Access Super class Members, Creating a Multilevel Hierarchy

Interfaces, Interface Fundamentals, Creating an Interface, Implementing an Interface, Using Interface References, Implementing Multiple Interfaces, Interfaces can be extended

Packages, Package Fundamentals, Packages and Member Access, Importing Packages, Static Import

Exception Handling, The Exception Hierarchy, Exception Handling Fundamentals, using Multiple catch clauses, Catching, subclass Exceptions, try blocks can be nested, Throwing an Exception

Multithreaded Programming, Multithreading fundamentals, The Thread Class and Runnable Interface, Creating Thread, Creating Multiple Threads, Determining When a Thread Ends, Thread Priorities, Synchronization, Thread Communication using notify(), wait() and notifyAll(), suspending, Resuming and stopping Threads.

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bca-205C++ Programming for Object Oriented Systems

Object Oriented Concepts, Tokens, Expressions and Control Structures Introduction: Basic Elements of Programming, Console I/O Operations.

Control Structures: Control and Looping Statements. Function: Function Prototyping, Call and Return by Reference, Inline Function, Default and Const Arguments, Function Overloading, Arrays, Manipulators and Enumeration.

Classes and Object, Object Oriented Methodology: Basic Concepts/Characteristics of OOP. Advantages and Application of OOP's, Procedural Programming Vs OOP

Classes and Objects: Specifying a Class, Creating Objects, Private & Public Data Members and Member Functions, Defining Inline Member Functions, Static Data Members and Member Functions. Arrays within Class, Arrays of Objects, Objects as Function Arguments, Returning Objects.

Constructors, Destructors, Operators Overloading and Inheritance. Constructors and Destructors: Introduction, Parameterized Constructors, Multiple Constructors in A Class, Constructors With Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Dynamic Constructors, Const Objects, Destructors Operators Overloading: Definition, Unary and Binary Overloading, Rules for Operator Overloading.

Inheritance: Defining Derived Classes, Types of Inheritance, Constructors and Destructors in Derived Classes.

Pointers Virtual & Friend functions and file handling Pointers: Pointer to Objects, this Pointer, New and Delete Operators, Virtual Function, Friend Functions. Opening, Closing a File, File Modes, File Pointers and their Manipulation, Sequential Input and Output Operations: Updating a File, Random Access, and Error Handling During File Operations, Command Line Arguments.

Duration: 3 hours	Max Marks: 50
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bca-206Computer Graphics

Interactive graphics, passive graphics, advantage of interactive graphics, classification of application

Point, line, DDA algorithm, Bresenham's line algorithm, circle generating algorithm, polynomial and spline curves algorithms, clipping operation, point, line, Cohen-Sutherland line clipping

2D transformation, matrix representation of 2D, composite transformation, translation, rotation, scaling, general pivot-point rotation, general fix scaling, reflection, shear, affine transformations and transformation functions

Parallel projection, perspective projection, 3D transformation, rotation, scaling, composite transformation, 3D transformation function.