

MAHARSHI DAYANAND SARASWATI UNIVERSITY,
AJMER

पाठ्यक्रम

SYLLABUS

SCHEME OF EXAMINATION AND
COURSES OF STUDY

FACULTY OF SCIENCE

BACHELOR IN COMPUTER APPLICATIONS

BCA Examination I Year

(w.e.f. 2019-20)

BCA Examination II Year

(w.e.f. 2020-21)

BCA Examination III Year

(w.e.f. 2021-22)



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सूचना

1. समय-समय पर संशोधन या पुनः निर्माण कर परिनियमों/अध्यादेशों/नियमों / विनियमों / पाठ्यक्रमों व पुस्तकों में परिवर्तन किया जा सकता है, तथा किसी भी परिवर्तन को छात्र को मानना होगा बशर्ते कि विश्वविद्यालय ने अन्यथा प्रकार से उनको छूट न दी हो और छात्र ने उस परिवर्तन के पूर्व वर्ष पाठ्यक्रम को पूरा न किया हो। विद्या परिषद द्वारा लिये गये निर्णय अन्तिम होंगे।

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M.D.S.U. Syllabus / Bachelor in computer applications (BCA)/3

TEACHING AND EXAMINATION SCHEME

Bachelor of Computer Applications - 1 Year

W.E.F. 2019-2020

Paper Name (Theory)		Lec	Exam	MARKS	
		Hours	Hours	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	Exam	MARKS	
		Hours	Hours	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.

4/M.D.S.U. Syllabus / Bachelor in computer applications (BCA)

Practical of 50 marks distribution is as under:

- 30 marks for practical examination exercise for 3 questions
- 10 marks for Viva-voce
- 10 marks for Laboratory Exercise File

Duration: 3 hours

Max Marks: 50

bca-101 Cyber Security Technologies & Practices

Information security concepts, 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-102 Computer 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,

M.D.S.U. Syllabus / Bachelor in computer applications (BCA)/5

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 device, 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-103 Data 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-104 Programming 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 of Operators, Expressions, Type Conversions and Library Functions.

6/M.D.S.U. Syllabus/Bachelor in computer applications (BCA)

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 to functions, Nested Functions, Recursive functions.

Arrays: Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays, Multi-Dimensional Arrays - Passing arrays to functions. Strings: Declaring and Initializing 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, Passing Structures to functions, Unions, typedef, enum, Bit fields. Pointers - Declarations, Pointer arithmetic, Pointers and functions, Call by value, Call by reference, Pointers and Arrays, Arrays of Pointers. Pointers and Structures. Meaning of static and dynamic memory allocation, Memory allocation functions.

Duration: 3 hours

Max Marks: 50

bcA-105 Discrete 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 Eulerian & Hamiltonian graphs.

Trees: spanning trees - Kruskal's Algo, 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

M.D.S.U. Syllabus / Bachelor in computer applications (BCA)/7

statements, tautology, contradiction, contingency, logical equivalence, quantifiers, arguments.

Duration: 3 hours

Max Marks: 50

bcA-106 Multimedia 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.

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TEACHING AND EXAMINATION SCHEME
Bachelor of Computer Applications - II Year

Paper Name (Theory)		Lec	Exam	MARKS	
			Hours	Min	Max
bca-201	Communication Skills	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	Exam	MARKS	
		Hours	Hours	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:

- 10 Questions of 1.5 mark each – 15 marks
- Answer should not exceed more than 50 words
- All questions are compulsory

Part B:

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

Part C:

- 3 Questions of 7+7+6 marks each – 20 marks.
- There will be an internal choice in each question.
- 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:

- 30 marks for practical examination exercise for 3 questions
- 10 marks for Viva-voce
- 10 marks for Laboratory Exercise File

Duration: 3 hours

Max Marks: 50

bca-201 Communication Skills

Types of communications – oral communication, written communication – formal, informal, business letters – types of letter, writing letters, business correspondence, applying for a job, resume writing, filling an employment application.

Report writing – definition and determining reports purpose; report planning, collecting information, developing an outline, sections of report, types of report, making reports writing effective, drafting circulars, notices, agenda and minutes of meetings.

Duration: 3 hours

Max Marks: 50

bca-202 Python Programming

Programming basics and strings, numbers and operators, variables, making decisions

Functions, classes and objects, organizing programs, files and directories

Building modules, text processing,

Writing a GUI with Python, Accessing Databases

Python with XML, Network Programming, Programming with C, Numerical Programming,

Web Application and Web Services, Integrating Java with Python

Duration: 3 hours

Max Marks: 50

bca-203 Database 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, validation rules

Data Entry Add record delete record 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, find 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

Duration: 3 hours

Max Marks: 50

bca-204 Java Programming

Introduction to Java, history, characteristics, Object Oriented Programming, data types, variables, arrays, difference between Java and C++ Control statements: Selection, iteration, jump statements, operators

Classes and Methods: Introducing classes, Class fundamentals, Declaring Objects, Assigning object reference variables. Introducing method, Constructors, The this Keyword, Garbage Collection- Finalize() method, Overloading methods, Using objects as parameters, Argument Passing, Returning Objects, Recursion, static and final keyword, Nested and Inner Classes, String Class, Command Line arguments.

Inheritance, Packages, Interfaces: Inheritance Basics, using super, method overriding, Dynamic method dispatch, abstract classes, Using final with inheritance, Packages, Access Protection, Importing packages, Interfaces.

Exception Handling, Multithreading, Applet: Exception handling fundamentals, Types, Using try, catch, throw, throws and finally, Java thread model, Creating a Thread, Creating multiple threads, Thread priorities, synchronization, Inter-thread communication, Applet Basics, Applet Skeleton, HTML applet tag – Passing parameters to applet

I/O Streams, Utility Classes: I/O Streams- Byte Streams, Character Streams, Reading and Writing Files, Legacy Classes and Interface: Vector, Stack, The Enumeration Interface, Utility classes: StringTokenizer, Date, Calendar, Random, Scanner

Javax.Swing Package: JButton, JLabel, JTextField, JPasswordField, JRadioButton, JCheckBox, JComboBox, JList, JToggleButton, JSpinner, JTabbedPane, JTable, JToolBar, JToolTip, JFrame, JPanel, JDialog, JSlider, Introduction to Event Handling: Event Classes – Event Listener interfaces

Duration: 3 hours

Max Marks: 50

bca-205 C++ 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

bca-206 Computer Graphics

Graphics hardware: The functional characteristics of the systems are emphasized

Input devices: Keyboard, touch panel, light pens, graphic tablets, joysticks, track ball, data glove, digitizer, image scanner, mouse, voice systems.

Hard copy devices: Input and non-impact printers such as line printer, dot matrix, laser, inkjet, electrostatic, flat bed and drum plotters.

Video Display Devices: Refresh cathode ray tube, raster scan displays, random scan displays, colour CRT monitors, direct view storage tube, flat panel displays, 3-D view devices, virtual reality, raster scan systems, random scan systems, graphics monitors and work stations.

Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques, character generation.

2-dimensional graphics: Cartesian and Homogeneous co-ordinate system, Geometric transformations (translation, scaling rotation, reflection, shearing, 2-dimensional viewing transformation and clipping (line, polygon and text).

TEACHING AND EXAMINATION SCHEME
Bachelor of Computer Applications - III Year

Paper Name (Theory)		Lec	Exam	MARKS	
			Hours	Min	Max
bca-301	Relational Database Management System	3	3	18	50
bca-302	JavaScript	3	3	18	50
bca-303	Computer Networks	3	3	18	50
bca-304	Programming in .NET with C#	3	3	18	50
bca-305	Internet Tools & Website Development	3	3	18	50
bca-306	Open Source Technology & Operating Systems	3	3	18	50
Total of Theory Marks				300	
Paper Name (Practical)		Pract	Exam	MARKS	
		Hours	Hours	Min	Max
bca-307	.NET Programming with C#	3	3	18	50
bca-308	Web Development, Java Script, PHP, MySQL)	3	3	18	50
bca-309	Oracle, SQL Programming & Linux	3	3	18	50
bca-310	Project	6	3	18	50
Total of Practical Marks				200	
Total of Theory & Practical Marks				500	

SCHEME OF EXAMINATION
BACHELOR OF COMPUTER APPLICATIONS

Theory:**Part A:**

- 10 Questions of 1.5 mark each – 15 marks
- Answer should not exceed more than 50 words
- All questions are compulsory

Part B:

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

Part C:

- 3 Questions of 7+7+6 marks each – 20 marks.
- There will be an internal choice in each question.
- 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:

- 30 marks for practical examination exercise for 3 questions
- 10 marks for Viva-voce
- 10 marks for Laboratory Exercise File

Duration: 3 hours

Max Marks: 50

bca-301 Relational Database Management Systems

Object of database systems, data abstraction, data definition language, data manipulation language, database administrator database model, database system architecture. Entity relationship model, entities and entity sets their relationship, mapping constraints, generalization, aggregation, use of ER model for the design of databases, sequential, random, index sequential file organization, relational algebra, normalization up to DKNF.

Object Oriented modeling, class, different types of attributes, generalization, inheritance, aggregation, encapsulation, distributed database design, architecture of distributed processing system, data communication concept, data placement, placement of DDBMS, and other components, concurrency control techniques, recovery, transaction management, need of recovery, recovery techniques, serializability, two-phase locking.

Query optimization and processing, algorithm for external sorting, select and join, object and set operations, heuristics in query optimization, temporal database concept, multi-media database, data-mining, association rule, classification, application, data-warehousing, need, architecture, characteristics, data layer, XML tree data model, document, DTD schema, query, database, data-warehousing verses view

Security and integrity of databases, security specifications in SQL, access control, flow control, encryption of public key infrastructure, cryptography and types. SQL*PLUS Data types, Constraints, Operators, DDL, DML, PL/SQL syntax, Data types, PL/SQL functions, Error handling in PL/SQL, package functions, package procedures, Oracle transactions. Stored procedures & functions, creation and execution of procedures, triggers

Duration: 3 hours

Max Marks: 50

bca-302 JavaScript

Overview of JavaScript, object orientation and JavaScript, syntactic characteristics, primitives, operations, and expressions, screen output and

14/M.D.S.U. Syllabus/ Bachelor in computer applications (BCA)

keyboard input, control statements, object creation and modification, arrays, functions, constructors, pattern matching using regular expressions, errors in scripts.

JavaScript execution environment, the Document Object Model, elements access in JavaScript, events and event handling, handling events from body elements, handling events from text box and password elements, the DOM2 event model, the navigator object, DOM tree traversal and modification, positioning elements, moving elements, element visibility, changing colors and fonts, dynamic content, stacking elements, locating the mouse cursor, reacting to a mouse click, slow movement of elements, dragging and dropping elements.

Duration: 3 hours

Max Marks: 50

bca-303 Computer Networks

OSI Model, significance of layer model, network, topology, network classification, switching and components.

Introduction to Ethernet, token ring, basic working and cable, bridges, routers, gateways, private and public networks

FDMA, TDMA, CDMA, personal communications system architecture, cordless telephony, digital enhanced cordless telecommunication.

Wireless technology: Land mobile vs satellite vs inbuilding communication system, cellular telephony, personal communication system/networks.

Perform and document fault isolation, Resolve or escalate, Verify and monitor resolution, IPv4 addressing and sub-netting, IPv4 address types, Unicast, Broadcast, Multicast, private IPv4 addressing, IPv6 addressing scheme, IPv6 addressing and IPv6 Stateless Address Auto IPv6 address types, Global unicast, Unique local, Link local, Multicast, Modified EUI 64, Auto-configuration, Anycast

Wireless architecture for mobile computing, wireless LANs, end user devices, MAC protocols, IEEE 802.11, mobile IP, wireless TCP, hand of adhoc networks, unicast and multicast communication, blue tooth.

Duration: 3 hours

Max Marks: 50

bca-304 Programming in .NET with C#

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general .ab, docking tab. visual development.

Variables -Declaring variables, Data Types, Forcing variables declarations, Scope & lifetime of a variable, Control flow statements: conditional statement, loop statement. Constants, Arrays, types of arrays, Collections.

Subroutines, Functions, Passing variable number of arguments, Optional Arguments, Returning value from function, MsgBox & Inputbox, Class, overloading, constructor, inheritance, overriding, interfaces

Working with Forms : Loading, showing and hiding forms, controlling one

M.D.S.U. Syllabus/ Bachelor in computer applications (BCA)/15

form within another. Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar, OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label. Designing menus : ContextMenu, access & shortcut keys.

Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer, Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid. Generating reports using CrystalReport Viewer

Introduction to C#, variables, constants, identifiers, data types, expressions and operators, flow control and exception handling, control structures, properties, indexes, namespace, classes, objects, structures

Object oriented programming C#, pointers, delegates and events

Duration: 3 hours

Max Marks: 50

bca-305 Internet Tools & Website Development

Internet – current state, hardware and software requirement, ISP, an internet account, web home page, URL, browser, security on web, searching tools, search engines, FTP, Gopher, Telnet, emails, TFTP

Web browser architecture, web page and multimedia, static dynamic and active web page, simple mail transfer protocol, simple network management protocol, hyper text transfer protocol

Basics of PHP: Introduction to PHP, what does PHP do? ,history of PHP , language basics ,data types , variables , expressions and operators , flow control statements , including code , embedding PHP in web pages.

Functions & Strings: Calling a function, defining a function, variable scope, function parameters, return values, variable functions, anonymous functions.

Strings: Accessing individual characters, cleaning strings, encoding and escaping, comparing strings, manipulating and searching strings, regular expressions.

Arrays & Objects: Indexed Vs associative arrays, identifying elements of an array, storing data in arrays, multidimensional arrays, extracting multiple values, converting between arrays and variables, traversing arrays, sorting. Objects: Creating an object, accessing properties and methods, declaring a class, introspection.

MySQL Overview: Introduction, connecting to and disconnecting from the server, Entering queries, Creating and using a database, Creating and selecting a database, creating a table, loading data into a table, Retrieving information from a table, selecting all data, selecting particular rows, selecting particular columns, sorting rows, date calculations, working with NULL values, pattern matching, counting rows, using more than one tables.

MySQL databases in PHP: Introduction, connecting to a MySQL database.

16/M.D.S.U. Syllabus / Bachelor in computer applications (BCA)

querying the database, Retrieving and displaying the results, modifying data, deleting data.

Max Marks: 50

Duration: 3 hours

bca-306 Open Source Technology & Operating Systems

Introduction to Operating Systems, goals of OS, operation of OS, resource allocator and related functions, classes of OS, batch processing, multi-processing, time sharing, distributed, real time systems, system calls, system programs, structure of OS, layer design of DOS, Unix, virtual machine OS, kernel based OS.

Process concept, interacting process, threads, fundamental of scheduling, scheduling criteria, long medium short term scheduling, scheduling algorithms, structure of concurrent system, critical section, critical region, inter-process communication, monitor and semaphores, implementation and uses.

Logical versus physical address, swapping, contiguous allocation, segmentation, paging, segmentation with paging, kernel memory allocation, page replacement algorithm, virtual memory, virtual memory with paging, demand paging, dead lock, characterization, methods for handling dead locks, prevention, avoidance, thrashing, allocation of frame, virtual memory using segmentation,

Architecture of Distributed system, inter-process communication protocol, network OS, issues in distributed design, issues of distributed file system, network structure, distributed system structure, file system, coordination.

Linux: History, programmer interface, file manipulation, process control, kernel, signals, file system, block and inodes, stream editor, character transliteration, ed, vi editor and there commands.

Shell script, variables, file name expansion, shell commands, looping and making decisions, array, subprogram, C interface with Linux, simple shell programs.