

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. 2015-16)
BCA EXAMINATION II YEAR
(w.e.f. 2016-17)
BCA EXAMINATION III YEAR
(w.e.f. 2017-18)

महर्षि दयानन्द सरस्वती विश्वविद्यालय, अजमेर

NOTICE

1. Change in Statutes/Ordinances/Rules/Regulations Syllabus and Books may, from time to time, be made by amendment or remaking, and a candidate shall, except in so far as the University determines otherwise comply with any change that applies to years he has not completed at the time of change. **The decision taken by the Academic Council shall be final.**

सूचना

1. समय-समय पर संशोधन या पुनः निर्माण कर परिणियमों/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।

TEACHING AND EXAMINATION SCHEME FOR BACHELOR IN COMPUTER APPLICATIONS I YEAR

Paper Name (Theory)	Lec	Exam Hours	Min Marks	Max Marks
BCA - 01 Management and Accounting	3	3	18	50
BCA - 02 Computer Fundamentals	3	3	18	50
BCA - 03 PC Software	3	3	18	50
BCA - 04 Fundamentals of C Programming	3	3	18	50
BCA - 05 Data Structure and Algorithm	3	3	18	50
BCA - 06 Multimedia Basic	3	3	18	50
Total of Theory				300

Paper Name (Practical)	Prac	Prac Hours	Min Marks	Max Marks
BCA - 07 PC Software Laboratory	3	3	18	50
BCA - 08 C Programming Laboratory	3	3	18	50
BCA - 09 Multimedia, Tally	3	3	18	50
Total of Theory				150
Grand Total of Theory + Practical				450

Note:

1. The question paper will be divided into 3 parts:

Part A:

- 10 Question 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 - 20 marks.
- There will be an internal choice in each question.
- Answer should not exceed 400 words
- A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.
- One internal and one external examiner shall conduct two practical exams. in a day, of a batch of 40 students.

4. Duration of practical exam is 3 hours.
5. One internal and one external examiner shall conduct two practical exams, in a day, of a batch of 40 students.
6. 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.

BACHELOR IN COMPUTER APPLICATIONS SCHEME OF EXAMINATION

The number of paper and the maximum marks for each paper together with the minimum marks required for a pass are shown against each subject separately. It will be necessary for a candidate to pass in the theory part as well as the practical part of a subject/paper, wherever prescribed, separately.

Classification of successful candidates shall be as follows:

First Division 60% of the aggregate marks prescribed at Part I Examination, Part II Examination, Part III

Second Division 48% Examination, taken together

All the rest shall be declared to have passed the examination, if they obtain the minimum pass marks in each subject viz. 36% no division shall be awarded at the Part I and Part II examination.

Note:

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Duration: 3 hours

Max Marks: 50

BCA-01 MANAGEMENT AND ACCOUNTING

Introduction to Management thought, functions, skills of a manager. Overview of Management functions with reference to planning process, leadership, motivation-implication for managers, theories of motivation.

Communication: Process, barriers to communication, role of electronic media and information technology in communication.

Cross-cultural issues in management, social and environmental responsibility
Organizational culture, individual perception, values, attributes, interpersonal effectiveness, power and politics, conflict management, team and group processes
Stress management: Various types of stress, coping mechanism
Accounting: Definition, concepts, standards, basic accounting, entries, ledger, triple column cash book, brief understanding of final accounts, Automatic

Accounting processes.

Financial statements, ratio analysis Cost accounting - CVP analysis, BEP and P/V graph Budgeting: Meaning of budgeting, flexible and fixed budgets.

Duration: 3 hours

Max Marks: 50

BCA-02 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, 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-03 PC SOFTWARE

MS-Windows: Introduction to MS Windows, concept of GUI, windows explorer, control panel, accessories, running applications under MS Windows.

MS-Word: Introduction to MS-Word, standard toolbar, word-wrap, text formatting, formatting of paragraphs, applying effects to text, applying animation to text, mail merge.

MS-Excel: Introduction to MS-Excel, working with toolbars, formatting, formulae, data management, graphs, charts, macros and other additional functions.

MS-PowerPoint: Introduction to PowerPoint slide creation, slide show, adding graphics, formatting, customizing and printing.

MS-Access: Introduction, understanding databases, creating a database and tables automatically, creating and customizing a form, adding, editing, sorting and searching of records, creating and printing reports, queries, creating a database and application, linking importing and exporting data, form, creating reports, creating charts and pivot tables.

Duration: 3 hours

Max Marks: 50

BCA-04 FUNDAMENTALS OF 'C' PROGRAMMING

C Language: Types, operators and expressions, variable names, data types and sizes, constants, declarations, operator, expressions and type conversions.

Control flow: Statements and blocks, selection and loops structures, break, continue, branching and labels.

Functions and program structure: Basics, functions and their arguments, external variables and static variables, scope rules, register variables, block structures, initialization, recursion.

Pointers and arrays: Pointers and addresses, pointers and function arguments, pointers and arrays, address arithmetic, character pointers and functions, multi-dimensional arrays, pointers arrays, pointer to functions.

Structures: Basics, structures and functions, arrays of structures, pointers to structures, unions and typedef.

File handling, file function

Duration: 3 hours

Max Marks: 50

BCA-05 DATA STRUCTURE AND ALGORITHMS

Fundamental Notations: Primitive and composite data types, time and space complexity of algorithms.

Data structures: Arrays, stacks, queues, D-Queue, linked lists, single link list, double link list, trees and graphs, depth first search, breath first search, kruskal algorithms, prism algorithm, prefix, postfix, infix, in-order, pre-order, post-order, recursive functions.

File structures: Concepts of fields, records and files, sequential file organization ISAM, hashing techniques, inverted lists and multi-lists

Sorting: Internal and external sorting, quick sort, merge sort, bubble, insertion, selection sorting.

Searching techniques: Linear and binary search, merging algorithms

Duration: 3 hours

Max Marks: 50

BCA-06 MULTIMEDIA BASICS

Introduction to Multimedia technology - computer, 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.

Build HTML, documents from scratch, view HTML, document using a variety of Web browsers organize information using lists, use HTML, frames and tables for page layout, connect to a variety of resources by using hypertext links, create style sheets to format the look and feel of the pages, understand key image theory concepts, create new images from scans or from scratch, optimize image sizes, create animated gifs and transparent images, be able to create graphical elements for use on web pages: buttons banners navigation bars, background titles, embed images and other multimedia.

**TEACHING AND EXAMINATION SCHEME FOR
BACHELOR IN COMPUTER APPLICATIONS II YEAR**

Paper Name (Theory)	Lec	Exam Hours	Min Marks	Max Marks
BCA - 10 Communication Skills	3	3	18	50
BCA - 11 Database Management Systems	3	3	18	50
BCA - 12 Client Server Technology	3	3	18	50
BCA - 13 Java Programming	3	3	18	50
BCA - 14 C++ Programming	3	3	18	50
BCA - 15 Computer Graphics	3	3	18	50
Total of Theory				300

Paper Name (Practical)	Prac	Prac Hours	Min Marks	Max Marks
BCA - 16 FoxPro Programming	3	3	18	50
BCA - 17 Java Programming	3	3	18	50
BCA - 18 C++ Programming & Computer Graphics	3	3	18	50
Total of Theory				150
Grand Total of Theory + Practical				450

Note:

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- 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 - 20 marks.

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- There will be an internal choice in each question.
- Answer should not exceed 400 words
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- Duration of practical exam is 3 hours.
- 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.

**BACHELOR IN COMPUTER APPLICATIONS
SCHEME OF EXAMINATION**

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Duration: 3 hours

Max Marks: 50

BCA-10 COMMUNICATION SKILLS

Paper is based on English Language

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- 11 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, multi-valued dependencies, normalization up to DKNF.

Relational Query Language: DDL, DML, DCL, database integrity, domain integrity, entity integrity, referential integrity, security, authorization, access matrix, concurrency, locks, serializability, recovery

Introduction to FoxPro: Creation of database, field types, adding records, editing and deleting of data, viewing data, navigating in data file, searching of data, memory variables and arrays.

Sorting the database, indexing, compound index files, managing multiple data files, setting environment using SET commands, setting filters, setting relations, date and time functions, character and file functions.

Programming with FoxPro, input and output, making decisions, loop constructs, debugging programs, setting up of screen displays, procedures and user defined functions, creating and printing formatted reports.

Duration: 3 hours

Max Marks: 50

BCA- 12 CLIENT SERVER TECHNOLOGY

Client/server computing: Evolution of client/server concepts, definition, history, need and motivation for client/server approach, client/server environments,

characterization of client/server computing, client/server types and examples. Client/server development tools, advantages of client/server technology connectivity, user productivity reduction in network traffic, faster delivery of systems. The Role of Client - Client request for service, dynamic data exchange, OLE, Common Object Request Broker Architecture (CORBA), Components of client/server applications

The Role of Server - Server functions, network operating systems, Novel Netware, LAN Manager, Server Operating System, System Application Architecture.

Architecture: Components of client-server architecture, application partitioning, the two-layer and three-layer architectures, communication between clients and servers, use of APIs in client/server computing, middleware technology in client/server computing. Open System Interconnectivity (OSI), Inter Process Communication (IPC)

Client/Server System Development - Network Management, Remote System Administrations, LAN Network Management, Privacy and Security Issue, Developing applications on RDBM, GUI design concepts

Duration: 3 hours

Max Marks: 50

BCA- 13 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

Introduction to classes, class fundamentals, constructor, methods, stack class, inheritance, creating multilevel hierarchy, method over riding

Packages and interfaces, exception handling, multi-threaded programming, I/O applets Java Library, string handling, string comparison, string buffer, utility classes, vector stack dictionary, applet class, introduction to AWT, working with frame windows.

Java Beans, beans architecture, AWT components, advantage of Java Beans, beans serialization, JDBC, class and methods, API components, JDBC components, driver, connectivity to database processing result and interfaces, RMI, comparison of distributed and non-distributed Java programs, interfaces, RMI architecture layer, ODBC, CORBA, CORBA services and products, CGI, structure of CGI.

Duration: 3 hours

Max Marks: 50

BCA - 14 C++ PROGRAMMING

Evolution of OOP, OOP Paradigm, advantages of OOP, comparison between functional programming and OOP approach, characteristics of object oriented language - objects, classes, inheritance, reusability, user defined data types, polymorphism, overloading.

Introduction to C++ identifier and keywords, constants, C++ operators, data type conversion, variable declaration, statements, expressions, input and output, conditional expression loop statements, breaking control statements. Defining a function types of functions, storage class specifiers, recursion, arrays, structures, pointers and structures, unions. Classes, member functions, objects arrays of class objects, pointers and classes, nested classes, constructors, destructors, overloading and overriding inline member functions, static class member, friend functions, dynamic memory allocation.

Inheritance, single inheritance, types of base classes, types of derivation, multiple inheritance, container classes, member access control. Function overloading, operator overloading, polymorphism, virtual functions, pure virtual functions, opening and closing of files, stream state member functions.

Duration: 3 hours

Max Marks: 50

BCA - 15 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 FOR
BACHELOR IN COMPUTER APPLICATIONS III YEAR**

Paper Name (Theory)	Lec	Exam Hours	Min Marks	Max Marks
BCA - 19 E-Commerce	3	3	18	50
BCA - 20 Computer Networks & Mobile Computing	3	3	18	50
BCA - 21 Visual Basic Programming	3	3	18	50
BCA - 22 Internet Tools & Website Development	3	3	18	50
BCA - 23 Management Information Systems	3	3	18	50
BCA - 24 Relational Database Management Systems	3	3	18	50
Total of Theory				300

Paper Name (Practical)	Prac	Prac Hours	Min Marks	Max Marks
BCA - 25 Visual Basic Programming	3	3	18	50
BCA - 26 Web Development (DHTML, Java Script, Exploring Internet, E-Commerce)	3	3	18	50
BCA - 27 Oracle & SQL Programming	3	3	18	50
BCA - 28 Project	3	3	18	50
Total of Theory				200
Grand Total of Theory + Practical				500

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Note: Attempt any 5 questions

Duration: 3 hours

Max Marks: 50

BCA - 19 E-COMMERCE

Electronic Commerce Framework, electronic and media convergence, traditional vs electronic business applications, the anatomy of E-commerce applications, overview of mobile computing technology, mobile data internet and mobile computing applications Networks - Security and firewalls, client - server network security threads, firewalls and network security, data message security, encrypted documents and electronic mail.

Architectural Framework for electronic commerce, World Wide Web as architecture, consumer oriented e-commerce, electronic data interchange (EDI), EDI Applications in business, EDI security document management and digital libraries. Consumer oriented applications, mercantile process models, mercantile models from the consumer's perspective, mercantile models from the merchant's perspective.

Note: Attempt any 5 questions

Duration: 3 hours

Max Marks: 50

BCA - 20 COMPUTER NETWORK & MOBILE COMPUTING

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.

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.

Note: Attempt any 5 questions

Duration: 3 hours

Max Marks: 50

BCA - 21 VISUAL BASIC PROGRAMMING

Introduction: Need of Visual languages, integrated development environment (IDE), advantage of Visual Basic, characteristics and features of Visual Basic, characteristics and features of Visual Basic - IDE, Projects, user interface, objects oriented, visual development and event-driven programming, forms/graphic controls, data processing, sharing with windows and internet applications. Visual Basic Programming and tools: An introduction of Visual Basic programming, simple program construction, statements, input/outputs, comments, editor, subroutines, controls flow statements, objects and variants.

Designing user interface - elements of user interface, understanding forms, menus and toolbars, designing menus and toolbars, building dynamic forms, drag and drop operations, working with menus, customizing the toolbars.

Controls - textbox, combo box, scroll bar and slider control operations, generating timed events, drawing with Visual Basic using graphics controls, coordinate systems and graphic methods, manipulating colors and pixels with Visual Basic. Database Programming with Visual Basic - data access methods, creating, reading and writing text files, data controls, creating queries.

Note: Attempt any 5 questions

Duration: 3 hours

Max Marks: 50

BCA - 22 INTERNET TOOLS AND 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

Active Server Pages, features, exception handling, components, application object methods, properties, events, collection, request object methods, properties, collections, response object members.

JavaScript, comment types, JavaScript reserved words, identifiers, events, primitive data types, escape sequence, data type conversion functions and meth-

ods, operators, control structures and statements objects applet fundamentals, applet life cycle, local and remote applet applications, tags, creating and passing parameters to applets, exception handling.

Note: Attempt any 5 questions

Duration: 3 hours

Max Marks: 50

BCA-23 MANAGEMENT INFORMATION SYSTEMS

Introduction to Management Information Systems (MIS): concepts, meaning elements and characteristics of MIS, MIS organization, MIS planning and building a business model.

Database and communications, definition requirement and user view of database, database software, file structure elements of a communication system and distributed data processing.

MIS technology definition of computer technology system and application software elements and support services elements.

Building and installing MIS application, development cycle analysis synthesis and implementation of MIS feasibility of installing MIS

Management and MIS, MIS aided decision making decision support systems education and training for MIS management's role in system development.

Note: Attempt any 5 questions

Duration: 3 hours

Max Marks: 50

BCA-24 RELATIONAL DATABASE MANAGEMENT SYSTEMS

Distributed database design, architecture of distributed processing system, data communication concept, data placement, placement of DDBMS and other components, concurrency, control and recovery, transaction management, need of recovery, recovery techniques, serializability, blocking, dead locks, introduction to query optimization.

Query optimization and processing, algorithm for external sorting, select and join, object and set operations, heuristics in query optimization, temporal database concept, multimedia database, data-mining, association rule, classification, application, data warehousing, need, architecture, characteristics, data layer Introduction to SQL, security and integrity of databases, security specifications in SQL.

Oracle RDBMS: Overview of three tier client server - technology, modules of Oracle and SQL * Plus Data types, constraints, operators, DDL, DML, (create, modify, insert, delete and update) searching, matching and Oracle functions, data types, PL/SQL functions, Error handling in PL/SQL, package functions, package functions, package procedures, Oracle transactions, SQL Stored Procedures.

Database Triggers: Introduction, Use and type of database triggers, triggers vs declarative integrity constraints, BEFORE Vs AFTER trigger combinations, creating a trigger, dropping a trigger.