MAHARSHI DAYANAND SARASWATI UNIVERSITY
AJMER

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पाठ्यक्रम

SYLLABUS

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF SCIENCE

B.Sc. Information Technology

I Year Examination
(w.e.f. 2017-18)
II Year Examination
(w.e.f. 2018-19)
III Year Examination
(w.e.f. 2019-20)

मूल्य : 10/-

महर्षि दयानन्द सरस्वती विश्वविद्यालय, अजमेर

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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 पुन: 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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B.Sc. (Information Technology)
Scheme of Examination

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 - 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 external examiner of a batch of 40 students in a day.

Duration of Practical exam in 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.

The number of paper and the maximum marks for each paper 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 (a) Part I Examination, (b) Part II Examination, (c) Part III Examination, taken together

Second Division 48% }

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:

Eligibility for admission in First Year of B.Sc. (IT) is 10+2 with Science examination of any board with at least 50% marks. As regards admission on reserved category seats government rules will be applicable.

TEACHING AND EXAMINATION SCHEME

B. Sc. Information Technology - I Year

Paper Name (Theory)		Lec	Exam Hours	Marks Min	Marks Max
bit-101	Computing Logics & Reasoning	3	3	18	50
bit-102	Foundation Course in IT	3	3	18	50
bit-103	Office Automation & PC Software	3	3	18	50
bit-104	C Programming & Data Sructures	3	3	18	50
bit-105	Circuit Analysis & Electronic Devices	3	3	18	50
bit-106	Data Management Systems	3	3	18	50
	Total of Theory Marks				**300**

Paper Name (Practical)		Pract Hours	Exam Hours	MARKS Min	MARKS Max
bit-107	Computer Logics & Reasoning	3	3	18	50
bit-108	Foundation Course in IT	3	3	18	50
bit-109	Office Automation & PC Software	3	3	18	50
	Total of Practical Marks				**150**
	Total of Theory & Practical Marks				**450**

Duration: 3 hours **Max Marks: 50**

bit-101 Computing Logics & Reasoning

Number systems: Natural numbers, integers, rational numbers, real numbers, complex numbers, arithmetic modulo a positive integer (binary, octal, decimal and hexadecimal number systems), radix r representation of integers, representing negative and rational numbers, floating point notation.

Binary arithmetic, 2's complement arithmetic, conversion of numbers from one of binary/ octal/decimal/hexadecimal number system to other number systems, codes (natural BCD, Excess-3, gray, octal, hexadecimal, alphanumeric – EBCDIC and ASCII) error codes.

Law of formal logic, connectivity, propositions, conditional statements, WFF, tautology, contradiction, logical equivalence, law of logic, duality, logical implications, normal forms, sets, sub-sets, finite and infinite sets, universal, power, disjoint sets, property of sets, union, intersection sets, distributive, compliment and property of compliment, Venn diagram, difference, cartisan product set.

Relation property, irreflexive, asymmetric, compatible universal complimentary relation, equivalence class, coordinate diagram, transitivity extension, closure, matrix representation and digraph, functions, mapping, composition of functions, associative mapping, inverse mapping, characteristic functions, recursions, linear recursion relation, non-homogenous relations.

Partial ordering, total order set, dual order, Hasse Diagram, Lexicographic ordering, least and greatest element, minimal and maximal element, upper and lower bound, well-order set, operations, well-ordering theorem, lattices property, bounded lattices, direct product, Boolean algebra, homomorphism, minimization function, gates, Boolean algebra and applications.

Duration: 3 hours **Max Marks: 50**

bit-102 Foundation Course in IT

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**

bit-103 Office Automation & PC Software

MS-Windows:

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

Microsoft Word - Word Processing Basics , Features of MS Word ,Typing ,inserting , selecting and deleting Text ,Format Painter ,Find and Replace, Paragraph Attributers , Moving, Copying and Pasting Text ,Columns , Drop Caps , Change Case ,Page Setting ,Illustration, Picture, Shapes, SmartArt, Screenshot ,Create Table ,Table Design View ,Link ,Hyperlink ,Bookmark ,Table Layout ,Comments ,Header & Footers ,Design Tab ,Page Setup & Printing ;Table of Contents ,Footnotes ,Mail Merge ,Review Tab ,View Tab, Document template.

Microsoft Excel - Introducing Excel ,Recognizing Interface Features Unique to Excel , Understanding Workbook Structure ,Navigating through Workbooks ,Making Workbook Selections .The Basics Of Data -Entering Text , Entering Dates & Numbers ,Editing Cell Entries ,Copying & Moving Data, Filling a Series, Managing Workbook Structure - Modifying Workbook & Worksheet Structure, Resizing Worksheet Elements, Hiding Workbook Component ,Workbook Protection, Formatting Cells - Applying Basic Formatting ,Formatting Numbers ,Exploring the Format Cells Dialog Box ,Creating & Applying Cell Styles ,Conditional Formatting, Working With Formulas - Excel Calculations ,Entering Formulas ,Formula Auditing, The Basics Of Functions - Using Basic Functions , Controlling Calculation Options ,Linking Worksheets ,Working With Graphics -Adding Clip Art ,Add an Image From a file, Image Adjustment, Working With Charts - Creating Charts , Modifying Chart Design ,Working with Chart Layout & Format, Working With Hyperlink - Using Bookmark ,External Link ,Sorting, Filtration And Validation - Sorting Data ,Filtering Data ,Data ValidationCustomizing Excel - Customize Tabs, Recording a Macro, Running a Macro.Preparing Files For Distribution - Print Area, Print Titles & Sheet Options, Renaming Sheets & Adding Headers/Footers, Printing Worksheets

Microsoft PowerPoint-Exploring the PowerPoint Interface, Views, Navigation & Keyboard Shortcuts, Setting Options & Saving Files, PowerPoint Design Essentials, Setting Up a New File, Changing Backgrounds, Placeholders & Bullets, Adjusting Placeholders, Adding Headers & Footers, Saving PowerPoint Templates

Duration: 3 hours **Max Marks: 50**

bit-104 C Programming & Data Structure

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.

Data Structures: Arrays, stacks, queues, d-queue, linked lists, single link list, double link list, trees, threaded tree, b-tree, graphs, depth first search, breath first search, kruskal algorithm, prism algorithm, prefix, postfix, infix, in-order, pre-order, post-order, recursive functions.

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

Shortest path, travel salesman problem

Searching techniques and merging algorithms

Duration: 3 hours **Max Marks: 50**

bit-105 Circuit Analysis & Electronic Device

Number Systems and Codes:- Binary, Decimal , Octal, Hexadecimal and their inter-conversions

Codes: BCD, Excess-3, Gray code etc.

Digital electronic signals and switches: - Concept on digital signal, logic levels, Activehigh, Active low signals, Switching Characteristic of Semiconductor diode,Transistor.

Logic Gates: - AND, OR, NOT, NOR, NAND, EX-OR, EX-NOR operations and theirtruth table. Boolean algebra and reduction techniques: - K-Maps and Quine, McClusky.

Arithmetic Operations: - Binary Addition, Subtraction, Multiplication, Division. 2.s Complement Subtraction. Circuits: - Half- Adder, Full Adder, Half Subtracter, FullSubtracter, 2-bit by 2-bit Multiplier , Various Code convertors.
Multiplexers (MUX):- Working of MUX, Implementation of expression using MUX.
Demultiplexers (DEMUX):- Implementation of expression using DEMUX, Decoder.FLIP FLOP s :- Concept of Sequential circuit, S-R, J-K , Preset & Clear, Master .
Slave JK D, T Flip Flops their truth tables and excitation tables, Conversion fromone type to another type of Flip Flop,registers, Logic families and theircharacteristics,characteristic of digital ICs

Duration: 3 hours **Max Marks: 50**

bit-106 Database Management Systems

Object of database systems, data abstraction, data definition language, data manipulation language, database manager, database administrator, tradeoffs between utilities of data and control of data.
Entity relationship model, entities and entity sets their relationship, mapping constraints, generalization, aggregation, use of ER model for the design of databases, implementation tradeoffs of sequential, random, index sequential file organization, relational algebra, relational calculus and normalization upto DKNF Relational Query Language: DDL, DML, database integrity, domain integrity, entity integrity, referential integrity, security, authorization, access matrix, concurrency, locks, serializability, recovery.
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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TEACHINGAND EXAMINATION SCHEME
B. Sc. Information Technology - II Year

	Paper Name (Theory)	Lec	Exam Hours	Marks Min	Marks Max
bit-201	Computer Oriented Statistical Methods	3	3	18	50
bit-202	Analog Circuits & Communications	3	3	18	50
bit-203	Client Server Technology	3	3	18	50
bit-204	Java Programming	3	3	18	50
bit-205	Computer Graphics	3	3	18	50
bit-206	Object Oriented Technology & C++ Programming	3	3	18	50
				Total of Theory Marks	300

	Paper Name (Practical)	Pract Hours	Exam Hours	MARKS Min	MARKS Max
bit-207	Java Programming	3	3	18	50
bit-208	Computer Graphics	3	3	18	50
bit-209	C++ & Statistical Programming	3	3	18	50
				Total of Practical Marks	150
				Total of Theory & Practical Marks	450

Duration: 3 hours **Max Marks: 50**

bit-201 Computer Oriented Statistical Methods

Characteristics of Numerical Computation, Approximation, Significant Digit, Errors, Introduction to Matrix, Types of Matrix, Square, Row, Column, Diagonal, Unit, Null, Upper Triangular, Lower Triangular, Symmetric, Skew Symmetric, operation of matrix, trace, transpose, addition, subtraction, multiplication, determinant, inverse, Introduction to Linear Equations,

Bisection method, method of successive approximation, method of false position, Newton's iteration method, Newton Raphson method, Horner's method

Gauss Jordan method, Gauss Elimination method, Iterative methods, Jacobi method of iteration, Gauss Seidel Iteration method

Gregory Newton Forward and Backward interpolation Formula, Gauss Forward and backward difference interpolation formula, interpolation with unequal intervals.

Duration: 3 hours **Max Marks: 50**

bit-202 Analog Circuits & Communications

Power Supplies: Rectifiers– Half wave, full wave and bridge rectifiers- Efficiency- Ripple factor- Regulation – Harmonic components in rectified output – Types of filters- Choke input (inductor) filter- Shunt capacitor filter- L section and ð

section filters – Block diagram of regulated power supply - Series and shunt regulated power supplies – Three terminal regulators (78XX and 79XX) – Principle and working of switch mode power supply (SMPS).RC Coupled Amplifier: Analysis and frequency response of single stage RC coupled CE amplifier.

Feedback: Positive and negative feedback- Effect of feedback on gain, band width, noise, input and output impedances.

Operational Amplifiers: Differential amplifier- Block diagram of Op-Amp- Idealcharacteristics of Op-Amp- Op-Amp parameters- Input resistance- Output resistance- Common mode rejection ratio (CMMR)- Slew rate- Offset voltages – Input bias current- Basic Op-Amp circuits- Inverting Op-Amp- Virtual ground- Non-inverting Op-Amp- Frequency response of Op-Amp. Interpretation of Op-Amp data sheets.

Applications of Op-Amps: Summing amplifier- subtracteor- Voltage follower- Integrator- Differentiator - Comparator- Logarithmic amplifier- Sine wave [Wein Bridge] and square wave [Astable] generators- Triangular wave generator- Monostablemultivibrator- Solving simple second order differential equation. Basic Op-Amp series regulator and shunt regulator.

Communications: Need for modulation-Types of modulation- Amplitude, Frequency and Phase modulation. Amplitude modulation-side bands- modulation index- square law diode modulator-Demodulation- diode detector. Frequency modulation working of simple frequency modulator- Ratio detection of FM waves- Advantages of frequency modulation. AM and FM radio receivers [block diagram approach].

Duration: 3 hours **Max Marks: 50**

bit-203 Client Server Technology

Client/Server Computing: Evolution of client/server concept, 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 (OLE) 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**

bit-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**

bit-205 Computer Graphics

Graphics Hardware: The fdnctional 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: Impact 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, two dimensional viewing transformation and clipping (line, polygon and text).

Duration: 3 hours **Max Marks: 50**

bit-206 Object Oriented Technology & C++ Programming

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 v/s 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.

TEACHING AND EXAMINATION SCHEME
B. Sc. Information Technology - III Year

	Paper Name (Theory)	Lec	Exam Hours	Marks Min	Marks Max
bit-301	Digital Electronics & Microprocessor	3	3	18	50
bit-302	Operating Systems	3	3	18	50
bit-303	E-Commerce	3	3	18	50
bit-304	VisualBasic.NET Programming	3	3	18	50
bit-305	Multimedia Basics	3	3	18	50
bit-306	Relational Database Management Systems	3	3	18	50
	Total of Theory Marks				**300**

	Paper Name (Practical)	Pract Hours	Exam Hours	MARKS Min	MARKS Max
bit-307	Linux, HTML Programming & Photoshop	3	3	18	50
bit-308	VisualBasic.NET and SQL Programming	3	3	18	50
bit-309	Digital Electronic Lab	3	3	18	50
bit-310	Project	6	3	18	50
	Total of Practical Marks				**200**
	Total of Theory & Practical Marks				**500**

Duration: 3 hours **Max Marks: 50**

bit-301 Digital Electronics & Microprocessor

Introduction to number systems, Logic gates OR, AND, NOT, X-OR, NAND, NOR gates -Truth tables.– Positive and negative logic – Logic families and their characteristics – RTL,DTL, ECL, TTL and CMOS.– Universal building blocks NAND and NOR gates. Laws of Boolean algebra De Morgan's Theorems – Boolean identities – Simplification of Boolean expressions– Karnaugh Maps – Sum of products (SOP) and Product of sums (POS).

Combinational and Sequential circuits: Multiplexer and De-Multiplexer – Decoder, Half adder, Full adder and Parallel adder circuits. Flip flops – RS, D, JK and JK Master-Slave (working and truth tables) - Semiconductor memories – Organization and working- Synchronous and asynchronous binary counters, Up/Down counters- Decade counter (7490) - working, truth tables and timing diagrams.

Introduction to Microcomputer and Microprocessor: Intel 8085 Microprocessor – central processing unit CPU – arithmetic and logic unit ALU – timing and control unit – register organization – address, data and control buses- pin configuration of 8085 and its description. Timing diagrams-

Instruction cycle, machine cycle, fetch and execute cycles. Instruction set of 8085, instruction and data formats- classification of instructions – addressing modes.Assembly language programming examples of 8 and 16 bit addition, subtraction, multiplication and division.Finding the largest and smallest in a data array.

Programming examples using stacks and subroutines.

Interfacing peripherals and applications: Programmable peripheral interface (8255) - D/A and A/D converters and their interfacing to the Microprocessor. Stepper motor control- seven segment LED.

Duration: 3 hours **Max Marks: 50**

bit-302 Operating Systems

Introduction to Operating Systems, goals of OS, operation of OS, resource allocater 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, micro-kernel based OS, architecture of Window 2000.

Process concept, interacting process, threads, process in Unix, process and thread in Windows 2000, process scheduling, fundamental of scheduling, scheduling criteria, long medium short term scheduling, scheduling algorithms upto multi-processor scheduling, algorithm evaluation.

Structure of concurrent system, critical section, critical region, inter-process communication, monitor and semaphores, implementation and uses.

Unix: History, programmer interface, file manipulation, process control, kernel, signals, file system, block and inodes, stream editor, character translit-eration, ed, vi editor and there commands.

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

Duration: 3 hours **Max Marks: 50**

bit-303 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.

Duration: 3 hours **Max Marks: 50**

bit-304 Visual Basic.NET Programming

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 tab, 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 form within another.Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar.. OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. LinkLabel.Designingmenus :ContextMenu, access &shorcut keys.

Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Datausing 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 Crystal Report Viewer

Duration: 3 hours **Max Marks: 50**

bit-305 Multimedia Basics

Introduction to Multimedia technology – Computer, Communication and Entertainment; Framework for multimedia systems; Advantages of MM, System components and the user inter face, MM platform, Hardware, Software, Commercial tools and standard.

Images and applications, image capture, compression, standards, Audio Compression and Decompression, Audio Synthesis, MIDI, Speech Recognition & Synthesis, Video Capturing, Compression & 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.

Duration: 3 hours **Max Marks: 50**

bit-306 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, deadlocks, 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, multi-media 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 & SQL*PLUS Data types, Constraints, Operators, DDL, DML,DCL – (Create, Modify, Insert, Delete and Update; Searching, Matching and Oracle Functions), Data types, PL/SQL functions, Error handling in PL/SQL, package functions, package procedures, Oracle transactions. SQL Stored Procedures.

Database Triggers : Introduction, Use & type of database Triggers, Triggers Vs. Declarative Integrity Constraints, BEFORE Vs. AFTER Trigger Combinations, Creating a Trigger, Dropping a Trigger.

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