



**पाठ्यक्रम**  
**SYLLABUS**

**SCHEME OF EXAMINATION AND COURSES OF STUDY**

**FACULTY OF SCIENCE**

**B.Sc. Information Technology**

**B.Sc. IT Part-I, Part-II, Part-III**

**2012-13 से प्रभावी(w.e.f.)**

**सत्र 2013-14**

**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 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।

© MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER  
Published and Printed by ALKA PUBLICATIONS, AJMER

☎ 0145-2426301

for Maharshi Dayanand Saraswati University, Ajmer

## COMPULSORY PAPER OF ENVIRONMENTAL STUDIES

Compulsory in I year for all streams at undergraduate level

Scheme of examination

Time 3 hrs

Pass Marks 36

Max. Marks 100

Theory

Theory paper will contain nine questions. The students are required to attempt five question in all including question no.1 which will be compulsory.

Q1 short answer type. Ten question of two marks each (compulsory)

10×2=20 marks

Q2 to Q9 essay type question of 20 marks each (attempt any four)

The students are required to visit some field or sites mentioned in the syllabus under the guidance of a teacher. The teacher shall certify that the student have visited the site and should further inform their respective principal in writing regarding the same.

Note:

1. The marks secured in this paper shall not be counted in awarding the division to a candidate.
2. The candidate have to clear compulsory paper in three chances
3. Non appearing or absent in the examination of compulsory paper will be counted a chance.

Unit 1: The Multidisciplinary nature of environmental studies  
Definition, scope and importance  
Need for public awareness.

- Unit 2: Natural Resources:  
Renewable and non-renewable resources:
- Natural resources and associated problems.
  - a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
  - b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems.
  - c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
  - d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
  - e) Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources. Case studies.
  - f) Land resources: Land as a resource, Land degradation, man induced Landslides, soil erosion and desertification.
  - Role of an individual in conservation of natural resources.
  - Equitable use of resources for sustainable lifestyles.

Unit 3: Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem  
d. Aquatic ecosystems ( ponds, streams, lakes, rivers, oceans, estuaries)

**Unit 4: Biodiversity and its conservation**

- Introduction – Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation
- Hot-spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**Unit 5: Environmental Pollution**

**Definition**

- Causes, effects and control measures of:-  
a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution  
e. Noise pollution f. Thermal pollution g. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

**Unit 6: Social Issues and the Environment**

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case Studies.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environmental Protection Act.
- Air ( Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wilde life Protection Act.
- Forest Conservation Act.
- Issues involved in enforcement of environmental legislation.
- Public Awareness.

**Unit 7: Human Population and the Environment**

- Population growth, variation among nations.
- Population explosion-Family Welfare Programme.
- Environment and Human health.
- Human Rights.
- Value Education.
- HIV/AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

**Unit 8: Field Work**

- Visit to a local area to document environmental assets- river / forest / grasslands / hill/ mountain.
- Visit to local polluted site- Urban /Rural / Industrial /Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems- pond, river, hill slope, etc.



**TEACHING AND EXAMINATION SCHEME FOR  
B. SC. (INFORMATION TECHNOLOGY) I YEAR**

Paper Name (Theory)	Lec	Exam Hours	Min Marks	Max Marks
BSCIT-01 Computing Logics & Reasoning	3	3	18	50
BSCIT-02 Foundation Course in IT	3	3	18	50
BSCIT-03 Office Automation PC Software	3	3	18	50
BSCIT-04 C Programming & Data Structures	3	3	18	50
BSCIT-05 Circuit Analysis & Electronic Device	3	3	18	50
BSCIT-06 Database Management System	3	3	18	50
<b>Total of Theory</b>				<b>300</b>

Paper Name (Practical)	Pract Hours	Pact Exam	Min Marks	Max Marks
BSCIT-07 PC Software Laboratory	3	3	18	50
BSCIT-08 C & Data Structure Programming	3	3	18	50
BSCIT-09 FoxPro Programming	3	3	18	50
<b>Total of Practical</b>				<b>150</b>
<b>Grand Total of Theory + Practical</b>				<b>450</b>

**Note:**

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

**Part A:**

1. 10 Question of 1 mark each – 10 marks
2. Answer should not exceed more than 20 words
3. All questions are compulsory

**Part B:**

1. 5 Questions of 2 marks each – 10 marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

**Part C:**

1. 3 Questions of 10 marks each – 30 marks.  
There will be an internal choice in each question.
2. Answer should not exceed 400 words
3. All questions are compulsory.

2. A Laboratory Exercise File should be prepared by each student for each

- practical paper and should be submitted during practical examinations.
3. Duration of practical exam is 3 hours.
  4. 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.

### B. SC. (INFORMATION TECHNOLOGY)

#### 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 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.

Duration: 3 hours

Max Marks: 50

#### BSC-IT – 01 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, cartesian 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

#### BSC-IT – 02 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 an

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

### BSC-IT – 03 OFFICE AUTOMATION 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 paragraphs, applying effects to text, applying animation to text.

**MS Excel:** Introduction to MS Excel, working with toolbars, formatting, formulae, data management, graphs and 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

### BSCIT – 04 C PROGRAMMING AND DATA STRUCTURE

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

Control statements, loop, jump, functions and program structure, Pointer and Arrays, structure, union and typedef, file handling, file function.

**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

### BSCIT – 05 CIRCUIT ANALYSIS & ELECTRONIC DEVICE

**Number Systems and Codes:-** Binary, Decimal, Octal, Hexadecimal and their interconversions,

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

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

**Logic Gates:-** AND, OR, NOT, NOR, NAND, EX-OR, EX-NOR operations and their truth 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 Subtractor, Full Subtractor, 2-bit by 2-bit Multiplier, Various Code converters.

**Multiplexers (MUX):-** Working of MUX, Implementation of expression using MUX.

**Demultiplexers (DEMUX):-** Implementation of expression using DEMUX, Decoder.

**FLIP FLOPS:-** Concept of Sequential circuit, S-R, J-K, Preset & Clear, Master.

**Slave J.K D, T Flip Flops** their truth tables and excitation tables, Conversion from one type to another type of Flip Flop. Registers. Logic families and their characteristics :- Characteristic of Digital ICs.

Duration: 3 hours

Max Marks: 50

### BSCIT – 06 DATABASE MANAGEMENT SYSTEMS

Object of database systems, data abstraction, data definition language, data manipulation language, database manager, database administrator, trade offs 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 trade offs 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.

**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.

### TEACHING AND EXAMINATION SCHEME FOR B.Sc (Information Technology ) II year

Paper Name (Theory)	Lec	Exam Hours	Max Marks	Min Marks
BSCIT-21 Computer Oriented Statistical Methods	3	3	50	18
BSCIT-22 Analog Circuits and Communications	3	3	50	18
BSCIT-23 Client Server Technology	3	3	50	18
BSCIT-24 Java Programming	3	3	50	18
BSCIT-25 Computer Graphics	3	3	50	18
BSCIT-26 Object Oriented Technology & C++ Programming	3	3	50	18
Total of Theory			300	

Paper Name (Practical)	Prac	Max Marks	Min Marks
BSCIT-27 Java Programming	3	50	18
BSCIT-28 Computer Graphics	3	50	18
BSCIT-29 C++ & Statistical Programming	3	50	18
Total of Practicals		150	18
Grand Total (Theory + Practicals)		450	

Note:

- The question paper will be divided into 3 parts:

**Part A:**

- 10 Questions of 1 mark each – 10 marks
- Answer should not exceed more than 20 words
- All questions are compulsory

**Part B:**

- 5 Questions of 2 marks each – 10 marks
- Answer should not exceed more than 50 words
- All questions are compulsory

**Part C:**

- 3 Questions of 10 marks each – 30 marks.  
There will be an internal choice in each question.

- Answer should not exceed 400 words
- All questions are compulsory.
- 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.
- 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.

Duration: 3 hours

Max marks 50

#### BSCIT-21 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

#### BSCIT - 22 ANALOG CIRCUITS AND COMMUNICATIONS

Power Supplies: Rectifiers- Halfwave, fullwave 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 O 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-

Ideal characteristics 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- subtractor- Voltage follower- Integrator- Differentiator - Comparator- Logarithmic amplifier- Sine wave [Wein Bridge] and square wave [Astable] generators- Triangular wave generator- Monostable multivibrator- 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*

### **BSCIT – 23 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*

### **BSCIT – 24 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 overriding 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*

### **BSCIT – 25 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: 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*

### **BSCIT – 26 OBJECT ORIENTED TECHNOLOGY & 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.

### B. Sc. (IT) Scheme of Examination

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,  
Second Division 48% } (c) Part III 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:

- Eligibility for admission in First year of B. Sc. (IT) is 10+2 with Science examination of any board with at least 50% marks.
- Candidate failing in not more than two theory papers at main examinations of B. Sc. (IT) Pt I, II & III shall be eligible for supplementary examinations subject to the condition that such candidates have passed in all the practical examinations/ papers.

### TEACHING AND EXAMINATION SCHEME FOR B.Sc (Information Technology) III year (2010)

Paper Name (Theory)	Lec	Exam Hours	Min Marks	Max Marks
BSCIT – 31 Digital Electronics & Microprocessor	3	3	18	50
BSCIT – 32 Operating Systems	3	3	18	50
BSCIT – 33 E-Commerce	3	3	18	50
BSCIT – 34 Visual Basic Programming	3	3	18	50
BSCIT – 35 Multimedia Basic	3	3	18	50
BSCIT – 36 Relational Database Management Systems	3	3	18	50
Total of Theory				300

Paper Name (Practical)	Pract Exam	Pract Hours	Min Marks	Max Marks
BSCIT – 37 Linux, HTML Prog. & PhotoShop	3	3	18	50
BSCIT – 38 Visual Basic and SQL Programming	3	3	18	50
BSCIT – 39 Digital Electronic Lab	3	3	18	50
BSCIT – 40 Project	3	3	18	50
Total of Practicals				200
Grand Total (Theory + Practicals)				500

Note:

- The question paper will be divided into 3 parts:

**Part A:**

- 10 Questions of 1 mark each – 10 marks
- Answer should not exceed more than 20 words
- All questions are compulsory

**Part B:**

- 5 Questions of 2 marks each – 10 marks
- Answer should not exceed more than 50 words
- All questions are compulsory

**Part C:**

- 3 Questions of 10 marks each – 30 marks.  
There will be an internal choice in each question.
- Answer should not exceed 400 words
- All questions are compulsory.



2. A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.
3. Duration of practical exam is 3 hours.
4. 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.

### SCHEME OF EXAMINATION

#### B. SC. (INFORMATION TECHNOLOGY)

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 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.

Duration: 3 hours

Max marks 50

### BSCIT – 31 DIGITAL ELECTRONICS AND 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

### BSCIT – 32 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, 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 transliteration, 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

### BSCIT – 33 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*

### **BSCIT – 34 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, Control Flow Statements, Objects, and variants, procedure and functions

Designing User Interface- Elements of User Interface, Under-Standing Forms, Menus and Toolbars, Designing Menus and Tool-bars, Building Dynamic Forms, Drag- and-Drop Operations, working with menus, customizing the toolbars.

Controls-Textbox, Combo Box, Scrollbar and Slider Controls Operations. Generating Timed Events. Drawing with Visual Basic using Graphics, controls, Coordinate systems and Graphic methods. Manipulating Colours and Pixels with Visual Basic.

Database Programming with Visual Basic-Data access methods, Creating, reading and writing text files. Data controls, creating Queries.

*Duration: 3 hours*

*Max marks 50*

### **BSCIT – 35 MULTIMEDIA BASIC**

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.

LAN, WAN, Storage of MM, M/M presentation and authoring, Digital representation of sound and transmission, brief survey of speech recognition and generation,

Developing Applications, Methodology, design, multimedia object, sharing multimedia and multimedia and the law.

Application of M/M; Intelligent M/M system, Desktop Virtual Reality (VR), VR operating System, Virtual environment displays and orientation tracking; visually coupled system requirements; intelligent VR software systems, 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 tiles, Embed images and other multimedia..

*Duration: 3 hours*

*Max marks 50*

### **BSCIT – 36 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, 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.

□□□