

TEACHING AND EXAMINATION SCHEME
B. Sc. Information Technology - II Year
WEF 2021 – 2022

Paper Name (Theory)		Lec	Exam Hours	MARKS	
				Min	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	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

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 each – 20 marks.
2. There will be an internal choice in each question.
3. Answer should not exceed 400 words

Practical & Projects:

Practical exams shall be conducted by one internal and one external examiner of a batch of 40 students in a day.

Duration of Practical exam is 3 hours.

A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.

Practical of 50 marks distribution is as under:

- a. 30 marks for practical examination exercise for 3 questions
- b. 10 marks for Viva-voce
- c. 10 marks for Laboratory Exercise File

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.

bit-201Computer 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.

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bit-202Analog 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 π 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 (CMRR)- 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- 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].

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.

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bit-204Java 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

bit-205 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).

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Duration: 3 hours	Max Marks: 50
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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.