# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

**(AnAutonomousInstitute affiliatedto CSVTU,Bhilai)**

## SCHEMEOFTEACHING ANDEXAMINATION (Effectivefrom2020-2021Batch)

## B.Tech.(ElectronicsandTelecommunicationEngineering)ThirdSemester

| Sl. No. | Board of Studies(BOS) | Courses(Subject) | Course Code | Period perWeek | | | Scheme ofExamination | | | TotalMarks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Theory/Lab | | | | |
| | | | | L | T | P | ESE | CT | TA | | |
| 1. | Applied Mathematics | Applied Mathematics-III | AM100301 | 2 | 1 | - | 100 | 20 | 30 | 150 | 3 |
| 2. | Electronics & Telecommunication | Electronics Devices | ET105302 | 2 | 1 | - | 100 | 20 | 30 | 150 | 3 |
| 3. | Electronics & Telecommunication | Digital System Design | ET105303 | 3 | - | - | 100 | 20 | 30 | 150 | 3 |
| 4. | Electronics & Telecommunication | Network Analysis | ET105304 | 3 | - | - | 100 | 20 | 30 | 150 | 3 |
| 5. | Electronics & Telecommunication | Signals & Systems | ET105305 | 3 | - | - | 100 | 20 | 30 | 150 | 3 |
| 6. | Electronics & Telecommunication | Electronic Devices LAB | ET105391 | - | - | 2 | 25 | - | 25 | 50 | 1 |
| 7. | Electronics & Telecommunication | Digital System Design LAB | ET105392 | - | - | 2 | 25 | - | 25 | 50 | 1 |
| 8. | Electronics & Telecommunication | Object Oriented Programming Lab using C++ | ET105393 | - | - | 2 | 25 | - | 25 | 50 | 1 |
| 9. | Electronics & Telecommunication | Electronics Workshop Lab/Mini Project-I | ET105394 | - | - | 2 | 25 | - | 25 | 50 | 1 |
| 10. | Electronics & Telecommunication | Health Hygiene & Yoga | ET100395 | - | - | 2 | - | - | 25 | 25 | 1 |
| 11. | Information & Technology | Cyber Laws and Ethics | IT100396 | - | - | - | - | - | 25 | 25 | - |
| **Total** | | | | **13** | **2** | **10** | **600** | **100** | **300** | **1000** | **20** |

**Note:**

**(a)Abbreviations used:L-Lecture,T-Tutorial,P-Practical,ESE-EndSemesterExam,CT-ClassTest,TA-Teacher'sAssessment**

**(b)Thedurationofendsemesterexaminationofalltheorypaperswillbeofthreehours.**

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

(AnAutonomousInstitute affiliatedto CSVTU,Bhilai)

## SCHEMEOFTEACHING ANDEXAMINATION (Effectivefrom2020-2021Batch)

## B.Tech.(ElectronicsandTelecommunicationEngineering)Fourth Semester

| Sl. No. | Board of Studies(BOS) | Courses(Subject) | Course Code | Period perWeek | | | Scheme ofExamination | | | TotalMarks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Theory/Lab | | | | |
| | | | | L | T | P | ESE | CT | TA | | |
| 1. | Electronics & Telecommunication | Analog Communication | ET105401 | 3 | 1 | - | 100 | 20 | 30 | 150 | 4 |
| 2. | Electronics & Telecommunication | Analog Electronics | ET105402 | 2 | 1 | - | 100 | 20 | 30 | 150 | 3 |
| 3. | Electronics & Telecommunication | Electromagnetic Field Theory | ET105403 | 3 | - | - | 100 | 20 | 30 | 150 | 3 |
| 4. | Electronics & Telecommunication | Microcontroller & Embedded Systems | ET105404 | 3 | - | - | 100 | 20 | 30 | 150 | 3 |
| 5. | Electronics & Telecommunication | IOT & Instrumentation | ET105405 | 3 | - | - | 100 | 20 | 30 | 150 | 3 |
| 6. | Electronics & Telecommunication | Analog Communication Lab | ET105491 | - | - | 2 | 25 | - | 25 | 50 | 1 |
| 7. | Electronics & Telecommunication | Analog Electronics Lab | ET105492 | - | - | 2 | 25 | - | 25 | 50 | 1 |
| 8. | Electronics & Telecommunication | Microcontroller & Embedded Systems Lab | ET105493 | - | - | 2 | 25 | - | 25 | 50 | 1 |
| 9. | Electronics & Telecommunication | Mini Project-II Lab | ET105494 | - | - | 2 | 50 | - | 25 | 75 | 1 |
| 10. | Chemistry | Biology for Engineers | AC100495 | - | - | - | - | - | 25 | 25 | - |
| **Total** | | | | **14** | **2** | **8** | **625** | **100** | **275** | **1000** | **20** |

**Note:**

**(a)Abbreviations used:L-Lecture,T-Tutorial,P-Practical,ESE-EndSemesterExam,CT-ClassTest,TA-Teacher'sAssessment**

**(b)Thedurationofendsemesterexaminationofalltheorypaperswillbeofthreehours.**

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

**(An Autonomous Institute affiliated to CSVTU, Bhilai)**

**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- AM100301 | APPLIED MATHEMATICS-III | L = 2 | T = 1 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | ESE Duration |
| | 100 | 20 | 30 | 150 | 3 Hours |

| Course Objective | Course Outcomes |
|---|---|
| The objective of this course is to familiarize the prospective engineers with techniques in calculus of multivariable and infinite series expansion of continuous function as well as some statistical treatment of discrete functions. More precisely, the objectives are:<br>• To instigate a thorough knowledge of partial differential equations which arise in mathematical descriptions of situations in engineering.<br>• To develop the tool of Fourier series for learning advanced Engineering Mathematics.<br>• To provide knowledge of Laplace transform of elementary functions including its properties and applications to solve ordinary differential equations.<br>• To originate a thorough study about random quantities and their description in terms of their probability.<br>• To introduce the tools of differentiation and integration of functions of complex variable that is used in various techniques dealing engineering problems | On successful completion of the course, the student will be able to:<br>**CO1**. To have a thorough knowledge of PDE which arise in mathematical descriptions of situations in Engineering.<br>**CO2**. To make the students understand that Fourier series analysis is powerful methods where the formulas are integrals and to have knowledge of expanding periodic functions that explore variety of applications of Fourier series.<br>**CO3**. To provide knowledge of Laplace transform of elementary functions including its properties and applications to solve ordinary differentials equations.<br>**CO4**. To study about a quantity that may take any of a given range of values that can't be predicted as it is but can be described in terms of their probability.<br>**CO5**. To provide a sound background of complex analysis to perform a thorough investigation of major theorems of complex analysis and to apply these ideas to a wide range of problems that include the evaluation of both complex line integrals and real integrals. |

**UNIT – I :Partial differential equation:** **CO1**

Formation, Solution by direct integration method, Linear equation of first order, Homogeneous linear equation with constant coefficients, Nonhomogeneous linear equations, Method of separation of variables; Equation of vibrating string (wave equation). **[8 Hrs]**

**UNIT – II: Fourier Series-** **CO2**

Euler's formula; Functions having point of discontinuity; Change of interval; Even and Odd function; Half range series; Harmonic Analysis. **[7Hrs]**

**UNIT – III: Laplace transform**: **CO3**

Definition; Transform of elementary functions; Properties of Laplace transform; Inverse Laplace Transform (Method of partial fraction, Using properties and Convolution theorem); Transform of Unit step function and Periodic functions; Application to the solution of ordinary differential equations. **[7Hrs]**

**UNIT – IV: Probability distributions:** **CO4**

Random variable; Discrete and continuous probability distributions; Mathematical expectation; Mean, Variance and Moments; Moment generating functions; Probability distribution (Binomial, Poisson and Normal distributions). **[7Hrs].**

**UNIT – V Complex Analysis**: **CO5**

Analytic functions; Cauchy-Riemann equations and its applications to flow problems; Complex integration; Cauchy theorem (without proof), Cauchy Integral formula (without proof); Expansion of complex functions (Taylor's and Laurent's series); Cauchy Residue theorem (without proof) and its application in evaluation of real definite integrals. **[7Hrs]**

**Text Books:**

| S.No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Higher Engineering Mathematics | B.S. Grewal | Khanna Publishers |
| 2 | Advanced Engineering Mathematics | H. K. Dass | S. Chand Publication |
| 3 | Advanced Engineering Mathematics | Erwin Kreyszig, | John Wiley & Sons. |
| 4 | Applied Engineering Mathematics | Madan Mohan Singh | BS Publications |
| 5 | Linear Algebra: A Modern Introduction | D. Poole | Brooks/Cole |

**Reference Books:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Calculus and Analytic geometry | G. B. Thomas and R. L. Finney | Pearson, Reprint. |
| 2 | Engineering Mathematics for first year | T. Veerarajan | Tata McGrawHill, New Delhi |
| 3 | Higher Engineering Mathematics | B. V. Ramana | Tata McGraw Hill New Delhi |
| | A text book of Engineering Mathematics | N.P. Bali and Manish Goyal | Laxmi Publications |

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**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105302 | Electronic Devices | L = 2 | T = 1 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | ESE Duration |
| | 100 | 20 | 30 | 150 | 3 Hours |

| Course Objective | Course Outcomes |
|---|---|
| To study semiconductor charge carriers transport phenomena.<br>1. To understand practical applications of PN junction diode.<br>2. To understand the basic working physics of BJT and study transistor biasing arrangements and its h-parameters.<br>3. To study the working principles of FETs and MOSFETs. | On successful completion of the course, the student will be able to:<br>CO1: **The student is able to gain complete knowledge of transport phenomena in semiconductor.**<br>CO:2 **Students are able to design practical circuit using diodes.**<br>CO:3 **Students understand the concepts of DC analysis of BJT.**<br>CO:4 **Students understand the necessity of Biasing and stabilization.**<br>CO:5 **Students understand the concept of FET and MOSFET.**<br>Students are able to differentiate between BJT and FETs. |

**UNIT– I Conduction in Semiconductor: CO1**

Transport Phenomena in semiconductor, Formation of P-N Junction, Properties of P-N Junction, P-N Junction Diodes; Semiconductor Diodes, V-I Characteristics, Effect of Temperature on V-I Characteristics, Ideal Diode, Diode equation, Diode Resistance, Diode Capacitance: Transition and Diffusion Capacitance.**[8Hrs]**

**UNIT– II Rectifying circuits and DC Power Supplies: CO2**

Load line analysis of diode circuit, Half wave rectifier: Voltage regulation, Ripple factor, ratio of rectification, Transformer Utilization factor. Full wave rectifier, Bridge rectifier. Filter circuits for power supply: Inductor filter, Capacitor filter, CLC or π filter. Zener diode: Break down mechanism, Characteristics, Specifications, Voltage regulator circuit using zener diode. **[7Hrs]**

**UNI - III Transistor and its configurations: CO3**

Introduction, Construction, Types: npn and pnp, Current components. Transistor as an amplifier, Transistor Characteristics, Transistor Circuit Configuration: Common Base (CB) Configuration, Common Emitter (CE) Configuration, Common Collector Configuration (CC), Early Effect. Ebers-Moll Model, Transistor as a switch. **[7Hrs]**

**UNIT– IV Transistor Biasing and Thermal stabilization: CO4**

The operating point, Bias stability, Stability factor, Emitter bias, Collector – to – base bias, Voltage divider bias with emitter bias, Emitter bypass capacitor. Bias- compensation. Transistor as an amplifier. **BJT at low frequency**: Transistor as a two port device and its Hybrid Model: Models for CB, CE, CC configurations and their Interrelationship. **[7Hrs]**

**UNIT–V Field Effect Transistor (FET) & MOSFET: CO5**

Introduction, Construction, Operation, V-I Characteristics, Transfer Characteristics, Drain Characteristics**. Metal Oxide Semiconductor Field Effect Transistor (MOSFET)**: Introduction, Construction, Symbol,Basic Operation, V-I Characteristics. MOSFET Types: Depletion MOSFET, Enhancement MOSFET, their characteristics and parameters, Body effect, Sub threshold conduction, **MOSFET Biasing:** Voltage divider bias, Feedback bias in E-MOSFET. **[7Hrs]**

| | | | | |
|---|---|---|---|---|
| | | | 1.00 | Applicable for AY 2021-22 Onwards |
| Chairman (AC) | Chairman (BoS) | Date of Release | Version | |

**Text Books:**

| S.No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Electronic Devices and Circuit Theory | Robert L. Boylestad & L. Nashelsky, K.. L. Kishore | PHI. |
| 2 | Integrated Electronics :Analog & Digital Circuit Sstems | Jacob Millman & Halkias | Tata McGraw Hill |
| 3 | Electronic Devices & Circuits | Donald A Neaman, | Tata McGraw Hill. |

**Reference Books:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Electronic devices and circuits | A.K. Maini & Varsha Agrawal | Wiley Publication. |
| 2 | Electronic Devices & Circuits | Allen Mottershead | PHI. |
| 3 | Microelectronic Circuits | Sedra and Smith | Oxford University Press. |

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**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105303 | Digital System Design | L = 3 | T = 0 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | ESE Duration |
| | 100 | 20 | 30 | 150 | 3 Hours |

| Course Objective | Course Outcomes |
|---|---|
| 1. To Design, Analyze and Interpret Combinational Circuits<br>2. To Design, Analyze and Interpret Sequential Circuits | At the end of this course students will demonstrate the ability to<br>**CO1:** Employ Binary Codes & Boolean algebra<br>**CO2:** Employ circuit minimization techniques.<br>**CO3:**Design and analyze combinational logic circuits such as adders, subtractors, multiplexers,<br>**CO4:** Design and analyze Sequential logic circuits such as flip-flops, shift registers and counters,<br>**CO5:** Design and analyze of Finite State Machine. |

**UNIT- I: Digital Fundamental and Boolean Algebra:** **CO1**

**Number Systems** – Decimal, Binary, Octal, Hexadecimal, **Logic Gates**: Basic and Universal logic Gates, **Binary Codes**: Weighted and Non-Weighted Codes, Sequential Codes, Self-Complementing Codes, Cyclic Codes; The 8421 BCD Code: BCD Addition; Excess-3 Code; The Gray Code: Binary to Gray and Gray to Binary Code Conversion; Error Detecting Codes: Parity, Error Correcting Code:7-bit Hamming code; Alphanumeric Codes: The ASCII Code, The EBCDIC Code.

**Boolean Algebra**: Logic Operations; Axioms and Laws of Boolean Algebra: Complementation Laws, AND Laws, OR Laws, Commutative Laws, Associative Laws, Distributive Laws, Redundant Literal Rule, Idempotence Laws, Absorption Laws, Transposition Theorem, Demorgan's Theorem; Duality; Reducing Boolean Expressions; Functionally Complete Sets of Operations; Boolean Functions and Their Representation. **[8Hrs]**

**UNIT-II: Minimization Techniques**: **CO2**

Expansion of a Boolean expression to SOP form; Expansion of a Boolean expression to POS form; Karnaugh maps up to 4 variables, Mapping and minimization of SOP and POS expressions; Concept of Don't Care Terms; Quine – McClusky Method (Up to 5 variable); Synthesis using AND-OR, NAND-NOR and XOR forms. **[7Hrs]**

**UNIT- III : Combinational Circuits:** **CO3**

MSI devices like Adder & Subtractor: Half and Full Adders, Half and Full Subtractor, Parallel Adders, BCD Adder, Comparators, Decoder: 3-Line to 8-Line Decoder, 8-4-2-1 BCD to Decimal Decoder, BCD to Seven Segment Decoder; Encoder: Octal to Binary and Decimal to BCD Encoder; Multiplexers: 2- Input Multiplexer,4-Input Multiplexer,16-Input Multiplexer; Demultiplexers: 1-Line to 4-Line & 1-Line to 8- Line Demultiplexer; Applications of Multiplexers. **[7Hrs]**

**UNIT-IV: Sequential Circuits:** **CO4**

Building blocks of Flip-Flops like S-R latch , Gated S-R Latch; D Latch, Edge Triggered Flip-Flops: S-R, D, J-K and T Flips-Flops; Master-Slave J-K Flip-Flop; Shift registers: SISO, SIPO, PISO,PIPO, Bi-Directional Shift Registers, Universal Shift register; Counters: Asynchronous Counters: Design of Asynchronous Counters; Ripple Counters: Synchronous Counters: Design of Synchronous Counters, 3-bit Synchronous Up counter, 3-bit Synchronous Down Counter,3-bit Synchronous Up-down Counter, Design Of Synchronous BCD Counter. **[8Hrs]**

**UNIT-V: Finite State Machine** **CO5**

Design of Finite State Machine: Mealy and Moore Model, Moore Finite State Machine for Sequence Detector, MOD counter & Serial Adder. Mealy Finite State Machine for Sequence Detector, MOD counter & Serial Adder. **[6Hrs]**

**Text Books:**

| S.No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Modern digital Electronics | R.P. Jain, | Tata McGraw Hill |
| 2 | Digital Electronics- An introduction to theory and practice. | W.H. Gothmann, | PHI |
| 3 | Digital Logic & Computer Dersign | M. Morris Mano | Pearson |

**Reference Books:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Digital Fundamentals | Floyd & Jain: | Pearson Education. |
| 2 | Digital Electronics:: | A. P. Malvino | Tata McGraw Hill. |
| 3 | Fundamental of Digital Circuit | A. Anand Kumar | PHI. |

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

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**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105304 | Network Analysis | L = 3 | T = 0 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | ESE Duration |
| | 100 | 20 | 30 | 150 | 3 Hours |

| Course Objective | Course Outcomes |
|---|---|
| The students will learn and understand<br>1. To understand the basic concepts and analysis of electric circuits.<br>2. To understand the use of two port parameters in analysing the electrical circuits.<br>3. To understand the initial and final condition in the network.<br>4.To understand the application of network theorems in electrical circuit.<br>5. To understand the phasor and sinusoidal steady state analysis of the electrical circuit. | On successful completion of the course, the student will be able to:<br><br>**CO1:** Understand basics electrical circuits with nodal and mesh analysis and to analyze two port parameters.<br>**CO2:** Understand the behavior of passive elements and their impact on network.<br>**CO3:** Apply Laplace Transform for steady state and transient analysis.<br>**CO4:** Appreciate electrical network theorems.<br>**CO5:** Appreciate the sinusoidal steady state analysis. |

**Unit I: Methods of Analyzing Circuits & Two Port Networks:** **CO1**

Node and Mesh Analysis, Source transformation and duality. Relationship of Two-Port Variables, Short-circuit Admittance Parameters, The Open Circuit Impedance Parameters, Transmission Parameters, The Hybrid Parameters, Relationships between Parameters Sets, Interconnection of Two-Port Networks: Series, Parallel and Cascade connection. **[7Hrs]**

**Unit II: Initial Conditions in Networks:** **CO2**

Initial Conditions in Elements, Properties of passive elements (capacitor, inductor and resistor) under transient and steady state condition. Geometrical Interpretation of Derivatives, A Procedure for Evaluating Initial Conditions, Initial State of a Network. First order circuit, Source free and with source RL and RC circuits. **[7Hrs]**

**Unit III : Application of Laplace Transformation in Circuit Analysis:** **CO3**

Introduction, The Laplace Transformation, Basic Theorems for the Laplace Transformation, and Application of Laplace Transformation Technique in Electric Circuit Analysis.

**Transforms of Signal Waveforms:** The Shifted Unit Step Function, The Ramp and Impulse Functions, Waveform Synthesis, The Initial and Final Value of f(t) from F(s). **[8Hrs]**

**Unit IV: Network Theorems:** **CO4**

Network theorems: Superposition, Reciprocity, Thevenin's, Norton's, Maximum power Transfer, Compensation and Tellegen's theorem as applied to AC circuits.

**Input Power and Power Transfer:** Energy and Power, Effective or Root- Mean Square Values, Average Power and Complex Power, Problems in Optimizing Power Transfer. **[7Hrs]**

**Unit V : Sinusoidal Steady State Analysis:** **CO5**

The Sinusoidal Steady State, Difference between DC and AC transients, Importance of transform domain with time domain for the analysis of AC transients. The Sinusoid and e±jωt; Solution Using e±jωt; Solution Using Rejωt or Imejωt; Phasors and Phasor Diagrams of RL, RC, and RLC circuit. **[7Hrs]**

**Text Books:**

| | | | | |
|---|---|---|---|---|
| | | | 1.00 | Applicable for AY 2021-22 Onwards |
| Chairman (AC) | Chairman (BoS) | Date of Release | Version | |

| S.No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Network analysis | Van, Valkenburg | Prentice hall of India |
| 2 | Circuits and Network | A. Sudhakar, S. P Shyammohan | Tata McGraw-Hill New Delhi |

**Reference Books:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Engineering Circuit Analysis | A William Hayt | McGraw-Hill Education |

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**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105305 | Signals and Systems | L = 3 | T = 0 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | ESE Duration |
| | 100 | 20 | 30 | 150 | 3 Hours |

| Course Objective | Course Outcomes |
|---|---|
| 1. To describe continuous time and discrete-time signals and systems.<br>2. Proficiently use various methods and approaches to solve problems with signals and systems prepared for upper-level courses in communication systems, control systems, and digital signal processing. | On successful completion of the course, the student will be able to:<br>**CO1**:- The student will be able to understand the classification of signals and systems.<br>**CO2**:- Gain knowledge about the frequency domain analysis of continuous time and discrete time signals.<br>**CO3**:-Use the Z-transform techniques to solve the system equations.<br>**CO4**:-Acquire basic knowledge in linear time invariant systems<br>**CO5**:-Analyze the state space analysis using LTI systems |

**UNIT-I : Classification Of Signals And Systems**: **CO1**

Representation of signals, Elementary signals, Basic Operation on Signals: Time shifting, Time reversal, Amplitude Scaling, Time Scaling. Signal addition and multiplication Classification of Signals: Deterministic and random, periodic and non-periodic, Energy and power, Causal and non-causal, Even and odd Signals, Classification of Systems: static and dynamic, causal and non-causal, linear and non-linear, time variant and time invariant, stable and unstable. **[8Hrs]**

**UNIT–II: Fourier Representation Of Signals**: **CO2**

Representation of Continuous time Fourier series(CTFS), Existence of Fourier series, Trigonometric form of Fourier series, Wave symmetry, Properties of CTFS. **Fourier Transform**: Magnitude and phase representation of Fourier transform, Existence of Fourier transform, Fourier transform of standard signals, Properties of continuous time Fourier transform, Fourier transform of periodic signals. **[7Hrs]**

**UNIT – III: Z-Transform:** **CO3**

Introduction, Z transform of some common sequences, Z transform and region of convergence of finite duration sequences, Properties of region of convergence, Properties of Z transform, Inverse Z transform, Transform analysis of LTI systems, Stability and causality, Solution of difference equations using Z transform **[7Hrs]**

**UNIT – IV: Linear Time Invariant Systems**: **CO4**

Response of a continuous time LTI System and Convolution integral using graphical method, Properties of continuous time LTI systems, Eigen functions of continuous time LTI systems, System described by Differential Equation, Response of a Discrete time LTI System and Convolution sum, Properties of discrete time LTI system, Eigen functions of Discrete Time LTI Systems, Systems described by difference equations. **[7Hrs]**

**UNIT – V: State Space Analysis:** **CO5**

The Concept of state, State space representation of discrete time LTI Systems, State space representation of continuous time LTI Systems, Solution of state equations for discrete time LTI Systems,, Solution of state equations for continuous time LTI Systems. **[7Hrs]**

**Text Books:**

| S.No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Signals & Systems | A. AnandKuma | PHI |
| 2 | Signals & Systems | H. P. Hsu | McGraw-Hill Publication |
| 3 | Signals & Systems | Alan Oppenheim & Alan Wilsky | PHI |

**Reference Books:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Signals and Systems | Simon Haykin | Wiley India |
| 2 | Signals, Systems and Communications | B.P. Lathi | BS Publications. |

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**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105391 | Electronic Devices Lab | L = 0 | T = 0 | P = 2 | Credits = 1 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | Lab Period |
| | 25 | 00 | 25 | 50 | 24Hrs |

| Course Objective | Course Outcomes |
|---|---|
| The students will learn and understand<br>1. To understand the characteristics of semiconductor diode and Zener diode.<br>2. To learn how to design rectifier circuit with and without filter circuit.<br>3. To understand the characteristics of transistor and its thermal stabilization. | On successful completion of the course, the student will be able to:<br>**CO1:-**Students are able to find out the cut-in voltage, static and dynamic resistance of semiconductor and Zener diode.<br>**CO2:-** Students are able to design the rectifier circuit and able to calculate the ripple factor and efficiency.<br>**CO3:-** Able to design the transistor configuration circuits and understand how to find out the input and output impedances using characteristics.<br>**CO4:-** Able to design the Zener diode as a voltage regulator.<br>**CO5:-**Students are able to find the stability factor. |

**List of Experiments: (At least Ten experiments are to be performed by each student)**

1. To draw the characteristics of a semi conductor diode and to find cut-in voltage, reverse resistance, static resistance and dynamic resistance.
2. To draw the characteristics of a zener diode
3. To design a half wave rectifier and to determine its efficiency and ripple factor.
4. To design a- full wave rectifier and determine the ripple factor and efficiency with filter.
5. To design a- full wave rectifier and determine the ripple factor and efficiency without filter.
6. To draw the characteristics of FET using BFW – 10
7. To draw the characteristics of CE configuration of a transistor amplifier.
8. To draw the characteristics of CB configuration of a transistor amplifier.
9. To draw the characteristics of CC configuration of a transistor amplifier.
10. To design a Zener regulator circuit and to find the regulation characteristics.
11. To draw the load line of a transistor amplifier under CE configuration.
12. To design and verify the self bias circuit operation.
13. To design and verify the voltage divider biasing circuit.
14. To verify the effect of emitter bypass capacitor.
15. To design a regulator circuit using Zener diode.

**List of Equipments/Machine Required:**

Circuit components, Breadboard, Hook-up wire, Power supply, CRO, Function generator

**Reference Book:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Laboratory Manual for Electronic Devices and Circuits | David A. Bell | PHI |

| | | | | |
|---|---|---|---|---|
| | | | 1.00 | Applicable for AY 2021-22 Onwards |
| Chairman (AC) | Chairman (BoS) | Date of Release | Version | |

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

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**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105392 | Digital System Design Lab | L = 0 | T = 0 | P = 2 | Credits = 1 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | Lab Period |
| | 25 | 00 | 25 | 50 | 24Hrs |

| Course Objective | Course Outcomes |
|---|---|
| The students will learn and understand<br>1. To Design, Analyze and Interpret Combinational Circuits<br>2. To Design, Analyze and Interpret Sequential Circuits | At the end of this course students will demonstrate the ability to<br>**CO1:** Design and analyze basic logic gates using Universal Gates.<br>**CO2:** Design and analyze combinational logic circuits such as adders, subtractors,<br>**CO3:** Design and analyze Encoders , Decoders, Multiplexers De-multiplexers & Code Convertors<br>**CO4:** Design and analyze RS,JK,T D-Flip-Flops<br>**CO5:** Design & analyze sequential logic circuits such as shift registers and counters. |

**List of Experiments: (At least Ten experiments are to be performed by each student)**

1. To Verify The Properties of NOR & NAND Gates As Universal Building Block.
2. Realization of Boolean Expression Using NAND Or NOR Gates.
3. To design and implement an X- OR Gate Using Only NAND Or NOR Gates Only.
4. To design and implement a Half Adder Circuit using Logic Gates And Verify its Truth table.
5. To design and implement a Full Adder Circuit And Verify its truth table (Using Two X-OR And 3 NAND Gates).
6. To design and implement a Half Subtractor Circuit by Using Basic Gates And Verify its truth table.
7. To design and implement a Full Subtractor Circuit by Using Basic Gates And Verify its truth table.
8. To design and implement a Circuit of 4 -Bit Parity Generator and Checker & Verify its truth table.
9. To design and implement a 4x1 Multiplexer using Logic Gates And Verify its truth table.
10. To design and implement a 1x4 De-Multiplexer using Logic Gates And Verify its truth table.
11. To design and implement a Programmable Inverter Using X-OR Gates & Verify its truth table.
12. To design Octal to Binary Encoder using Logic Gates and Verify its truth table.
13. To design BCD to Excess-3 Decoder using Logic Gates And Verify its truth table.
14. To design Binary to Gray Code Converter and Verify its truth table.
15. To Design A Comparator Circuit & Verify its truth table.
16. To Construct A RS Flip Flop Using Basic & Universal Gates (NOT, NOR & NAND)
17. To Construct A J.K. Master Slave Flip Flop & Verify its truth table
18. To Verify The Operation of A Clocked S-R Flip Flop And J. K. Flip Flop
19. To Construct A T & D Flip Flop Using J. K. Flip Flop And Verify Its Operations & truth table.
20. To Construct and study the operation of a 4-bit Shift Register
21. To Verify the Operation of 4-bit Binary Asynchronous Counter.
22. To Verify The Operation of a Synchronous Decade Counter.
23. To perform the operation of BCD Counter Using 7490.

**List of Equipments/Machine Required:**

Various ICs , Power Supply, Hook-Up Wires.

**Reference Book:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Digital Electronics and Logic Design Lab: Workbook [EC-382] | WBUT | New Age International Pvt Ltd |

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

**(An Autonomous Institute affiliated to CSVTU, Bhilai)**

**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105393 | Object Oriented Programming in using C++ Lab | L = 0 | T = 0 | P = 2 | Credits = 1 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | Lab Period |
| | 25 | 00 | 25 | 50 | 24Hrs |

| Course Objective | Course Outcomes |
|---|---|
| The students will learn and understand<br>To introduce he concepts of Object-Oriented Programming Paradigm and the programming constructs of C++ | On successful completion of the course, the student will be able to:<br>**CO1:-**Apply the various basic programming constructs like decision making statements, Looping statements, functions, concepts like overloading, inheritance, polymorphism, virtual functions , constructors and destructors.<br>**CO2:-**Illustrate the concept of Virtual Classes, inline functions and friend functions.<br>**CO3:-**Compare the various file stream classes; file types, usage of templates and exception handling mechanisms.<br>**CO4:-**Compare the pros and cons of procedure oriented language with the concepts of object oriented language. |

**List of Experiments: (At least Ten experiments are to be performed by each student)**

1. Write a C++ Program to create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH () to insert an element and member function POP () to delete an element check for overflow and underflow conditions.
2. Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write member functions ADD (), SUB (), MUL (), DIV () to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.
3. Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.
4. Write a C++ Program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.
5. Write a C++ Program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the operators ++ and == to concatenate two Strings and to compare two strings respectively.
6. Write a C++ Program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.
7. Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate_Area() and Calculate_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.
8. Write a C++ Program to create two classes each class consists of two private variables, a integer and a float variable. Write member functions to get and display them. Write a FRIEND Function common to both classes, which takes the object of above two classes as arguments and the integer and float values of both objects separately and display the result.
9. Write a C++ Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of

these arrays individually.

10. Write a C++ Program to check whether the given string is a palindrome or not using Pointers.
11. Write a C++ Program to create a File and to display the contents of that file with line numbers.
12. Write a C++ Program to merge two files into a single file.

**List of Equipment's/Machine/Software Required:** C++ compiler

**Reference Books:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | Object-Oriented Programming with Ansi and Turbo C++ | Ashok N Kamthane | Pearson Education |
| 2 | Object-Oriented Programming with C++ | E. Balagurusamy | TMH |

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

**(An Autonomous Institute affiliated to CSVTU, Bhilai)**

**SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)**

**B.Tech. (Electronics and Telecommunication Engineering) Third Semester**

| Subject Code :- ET105394 | Electronic Workshop Lab/Mini Project--I | L = 0 | T = 0 | P = 2 | Credits = 1 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | Lab Period |
| | 25 | 00 | 25 | 50 | 24Hrs |

| Course Objective | Course Outcomes |
|---|---|
| 1. The objective is to make the students capable to Recognize various Electronics Component.<br>2. Able to understand the Practical use of the Component by making Minor Projects. | On successful completion of the course, the student will be able to:<br>**CO1:-**work on Printed Circuit Design tool and implement Various PCB Design.<br>**CO2:-**learn various Implementation Technology<br>**CO3:-**Understand the Process through which they can fabricate PCB.<br>**CO4**:-Design Various Electronic Circuit in PCB<br>**CO5:-**Understand the Use of Multimeter, Oscilloscope, Signal Generator etc. |

**List of Experiments: (At least Ten experiments are to be performed by each student)**

1. To understand the operational features of Analog and Digital Multimeter.
2. To understand the operational features of Cathode Ray Oscilloscope.( Calibration, Time/div, Volt/div, X-Y, single channel, Dual channel)
3. To understand the operational features of Function Generator ( Measurement of volt and frequency, attenuation).
4. Measurement of capacitors (mica, ceramic, paper, electrolytic and variable) using CRO and LCR Meter and verify with color coding.
5. Measurement of resistors- Fixed (carbon, wire wound, metal film and variable) using CRO and Multimeter and verify with color coding and identification of special resistors like Thermistor, LDR and VDR (FET)
6. Measurement of inductors (fixed) using CRO and LCR meter.
7. Study of Diodes (Ge and Si), Zener diodes and LEDs.( terminals, resistance and capacitance in forward biased and reversed biased conditions).
8. Study of Transistors ( npn, pnp) using multimeter and CRO. (terminals, forward biased and reversed biased junction conditions.)
9. To understand the types of PCB.
10. To understand PCB designing rules ( Art Work and layout) using EDA tools.
11. To design and fabricate a DC power supply using bridge rectifier on PCB.
12. To learn the use of SMD rework station.
13. Mini project ( compulsory)

**List of Equipments/Machine Required:**

Film Making unit, Deep coating machine, UV exposure unit, PCB curing machine, PCB etching machine, PCB drilling machine, PCB tining machine, Magnifying lamp, Soldering &desoldering iron, LCRQ meter, Digital & analog multimeter, PCB making software (ULTIBOARD, PROTEL, EXPRESS LAB, EDWin XP), Resistance color code chart, Capacitor color code chart, Transistor chart, CRO, SMD work station

**Reference Book:**

| S. No. | Title | Authors | Publisher |
|---|---|---|---|
| 1 | A Monograph on Electronic design Principles | N.C. Goyal& R.K. Khetan | KHANNA PUBLISHERS |
| 2 | Electronic Measurement and Instrumentation | A.K. Shawney | S.K. Kataria & Sons |

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

(An Autonomous Institute affiliated to CSVTU, Bhilai)

SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)

B.Tech. (Electronics and Telecommunication Engineering) Third Semester

| Subject Code ET100395 | Health, Hygiene and Yoga | L = 0 | T = 0 | P = 2 | Credits = 1 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | ESE Duration |
| | --- | -- | 25 | 25 | --- |

***COURSE OBJECTIVES***

- ***To provide understanding and importance of health***
- ***To provide insight into the hygiene aspect and quality of lifestyle***
- ***To study the concepts of various medical therapy***
- ***To practice different types of yogasan and pranayama.***
- ***To provide knowledge about common diseases and its cure through yogasan and pranayama.***
- ***To develop and improve concentration through various methods***

***COURSE OUTCOMES***

***On successful completion of the course, the student will be able to:***

- ***Demonstrate a better understanding about mental and physical health for human life***
- ***Understand the correlation of mental and physical health with hygiene and yoga***
- ***Demonstrate the understanding about the health hazards resulting due to improper lifestyle***
- ***Display understanding about eminent yogis and primary texts on yoga***
- ***Apply various techniques of yoga to counter various lifestyle issues***
- ***Understand the utility of health, hygiene and yoga for society welfare***

**UNIT – I**

**(A) Health:**

- Concept of Health – Physical and Mental Health and Wellbeing
- Meaning and definition of Health according to WHO and Ayurveda Charaksamhita
- Primary Health Care –Food, Nutrition and Cleanliness
- Human Psychology and Health Consciousness

**(B) Hygiene:**

- Meaning, definition and importance of Hygiene in life
- Types of Hygiene and general rules for Hygiene and Cleanliness
- Ayurveda: Ayurveda, Vata, Pitta and Cough

**UNIT – II**

**(A) Medicinal Cure:**

- Introduction and basic concepts of common streams of medicinal cure
- Introductory knowledge about modes of operation of Alopathy, Ayurveda, Homoeopathy, Bio-chemic, Unani, Siddha, Acupressure, Acupuncture and Naturopathy
- Introduction of Anatomy and Physiology concerned

**(B) Occupational Health:**

- Diseases and their occupational relevance, risk factors for deficiency diseases
- Drugs, Tobacco, Alcohol and Food intoxication: chemical agents, side effects and control measures
- Stress, anxiety, depression and emotional imbalance: causes and prevention

| | | | 1.00 | Applicable for AY 2021-22 Onwards |
|---|---|---|---|---|
| Chairman (AC) | Chairman (BoS) | Date of Release | Version | |

**(C) Modern Silent Killers:**

- High blood pressure, diabetes and cancer – causesand cure
- Common health problems due to stomach disorders such as indigestion, acidity, etc.

**UNIT – III**

**(A) Yogasans:**

- Meaning, concept and importance of Yoga for healthy life
- Yogasans and its mode of operation, Prone and Supine Posture
- Common Yogasans such as Bhujangasan, Halasan, Padmaasan, Sarvangasan, Shavasan, Surya Namaskar, Utshep Mudra, Vajrasan, Jal-Neti, etc.
- Asans for Brain: Shirshpadasan, Shashankasan
- Asans for Eye Sight: Tratak, Neti-Kriya

**(B) Yogis and Yogic Texts:**

- Ashtang yoga from Patanjali Yoga Sutra
- Somantic and Psychosomatic from YogVashishth
- BhagwadGeeta
- Basic knowledge of Shat Darshan

**UNIT – IV**

**(A) Pranayama:**

- Definition, concept and types of Pranayama
- NadiShodhan, AnulomVilom, Bhastrika, Bhramari,Shitakari, etc.
- Usefulness of Pranayamafor students
- Introduction to Kumbhak

**(B) Meditation:**

- Basic concept of Meditation
- Concentration of mind: Dhyan
- Concentration on breath; Japa, Ajapajap, Internal Silence
- Concentration on point of light, Concentration on feeling, Concentration on figure
- Visualization in mental sky

**UNIT – V**

**Social Awareness and Community Health:**

- NSS / NCC activities for society and nation
- Health and family welfare
- Nutrition and welfare programmes for childs, elders and divyangs
- Blood Donationand health check-up campaign
- Green environment campaign - Plantation
- Co-management of HIV and TB diseases
- Gender Equity and National Integrity
- Natural calamities and Disaster Management
- Road safety awareness, Swachhataaawareness, etc.

| ***Text Books:*** | ***Reference Books:*** |
|---|---|
| ***1.*** *Health, Hygiene & Yoga; Dr P. B. Deshmukh; Gyan Book Private Ltd. New Delhi.*<br>***2.*** *Health, Hygiene and Yoga; Dr. ManjuShukla; Gyan Bharti Publications, New Delhi.* | ***1.*** *Yogic MateriaMedica.*<br>***2.*** *Asan, Pranayama Mudrabandha; Swami SatyanandaSaraswati; Yoga Publication Trust, Munger (Bihar).*<br>***3.*** *Fundamentals of Yogic Practices - A Complete Guide on Yoga; Shrikant, R. Kushwah, Y. Kushwah; KhelSahitya Kendra, Delhi.* |

# SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

(An Autonomous Institute affiliated to CSVTU, Bhilai)

SCHEME OF TEACHING AND EXAMINATION (Effective from 2020-2021 Batch)

B.Tech. (Electronics and Telecommunication Engineering) Third Semester

| Subject Code (IT100396) | CYBER LAWS & ETHICS | L = 0 | T = 0 | P = 0 | Credits=0 |
|---|---|---|---|---|---|
| Evaluation Scheme | ESE | CT | TA | Total | ESEDuration |
| | - | - | 25 | 25 | -- |

| CourseObjectives | CourseOutcomes |
|---|---|
| 1. To explore brief idea about the CYBER LAWS.<br>2. To get the basic idea about IT ACT.<br>3. Awareness about ecommerce and related cyber laws.<br>4. Awareness regarding Trademarks, Copyrights and Patents.<br>5. Awareness regarding Cyber Ethics. | **After the completion of course, student will be**<br>**CO 1**. Understand Cyber laws<br>**CO 2**. Understand IT Act.<br>**CO 3**.Describe Information Technology act and Related Legislation.<br>**CO 4**. Demonstrate Electronic business and legal issues.<br>**CO 5**. Interpret Cyber Ethics. |

**UNIT – I:Introduction to Cyber law:** CO1

Evolution of computer Technology, emergence of cyber space. Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, CyberspaceWeb space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.

**UNIT – II:Information Technology Act**: CO2

Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

**UNIT – III:Cyber law and Related Legislation:** CO3

Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code.

**UNIT – IV:Electronic Business and legal issues**: CO4

Evolution and development in E-commerce, paper vs paper less contracts E-Commerce models-B2B, B2C, E security. Business, taxation, electronic payments, supply chain, EDI, E-markets, Emerging Trends.

**UNIT-V:Cyber Ethics**: CO5

The Importance of Cyber Law, Significance of cyber Ethics, Need for Cyber regulations and Ethics. Ethics in Information society, Introduction to Artificial Intelligence Ethics: Ethical Issues in AI and core Principles, Introduction to Block chain Ethics

## Text Books:

| S.No. | Title | Authors | Publisher |
|---|---|---|---|
| 1) | Cyber Laws: Intellectual property & E Commerce, Security | Kumar K | dominant Publisher |
| 2) | Cyber Ethics 4.0, Christoph Stuckelberger | Pavan Duggal | Globethic |
| 3) | Information Security policy & Implementation Issues | NIIT | PHI |
| 4) | Computers, Internet and New Technology Laws | Karnika Seth | Lexis Nexis Butterworths Wadhwa Nagpur |

**Reference Books:**

| S.No. | Title | Authors | Publisher |
|---|---|---|---|
| 1) | Legal Dimensions of Cyber Space | Verma S, K, MittalRaman | Indian Law Institute, New Delhi |
| 2) | Cyber Law | JonthanRosenoer | Springer, New York, (1997) |
| 3) | The Information Technology Act 2005 | A Handbook | OUP Sudhir Naib,, New York, (2011) |
| 4) | Information Technology Act, 2000 | S. R. Bhansali | University Book House Pvt. Ltd., Jaipur (2003) |
| 5) | Cyber Crimes and Law Enforcement | Vasu Deva | Commonwealth Publishers, New Delhi, (2003) |