TEACHING AND EXAMINATION SCHEME FOR
B. Sc (Computer Science) I Year

Paper Name (Theory)	Lec	Exam Hours	Min Marks	Max Marks
BSCCS – 01 Computer Programming Fundamental	3	3	18	50
BSCCS – 02 Digital Computer Organization	3	3	18	50
BSCCS – 03 Electronics I	3	3	18	50
BSCCS – 04 Electronics II	3	3	18	50
BSCCS – 05 Computer Maintenance I	3	3	18	50
BSCCS – 06 Computer Maintenance II	3	3	18	50
			Total of Theory	300

Paper Name (Practicals)	Pract Hours	Pract Exam	Min Marks	Max Marks
BSCCS – 07 Computer Lab (Digital)	3	3	18	50
BSCCS – 08 Electronics Practical Lab	3	3	18	50
BSCCS – 09 Programming Lab	3	3	18	50
			Total of Practicals	150
			Grand Total (Theory + Practicals)	450

Note:
1. The question paper will be divided into 3 parts:
   Part A:
   1. 10 Question of 1.5 mark each – 15 marks
   2. Answer should not exceed more than 50 words
   3. All questions are compulsory
   Part B:
   1. 5 Questions of 3 marks each – 15 marks
   2. Answer should not exceed more than 50 words
   3. All questions are compulsory
   Part C:
   1. 3 Questions of 7 + 7 + 6 marks – 20 marks.
      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. One internal and one external examiner shall conduct two practical exams, in a day, of a batch of 40 students.
4. Duration of practical exam is 3 hours.
5. 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. (Computer Science)
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. (CS) 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.

BSCCS – 01 COMPUTER PROGRAMMING FUNDAMENTAL

C Programming Practical Laboratory
Different data types and sizes, variable names, constants, Declaration, Type conversion,
Arithmetic, operations, Relation and Logical operators, Increment and Decrement operators, Bitwise and Logical operators, Assignment operators and Expressions, Precedence and order of Evaluation.

Statement and Blocks, if-else, else, switch, while, for, do-while loops, break, continue, go to and labels, function and Program structures, function structures, Function Arguments, External, Static, Register variables, Scope rules, structure, initialization, Recursion.

Pointer and Addresses, Pointers and Function arguments, Pointer and Arrays, address arithmetic, character Pointers and functions, Multidimensional Arrays Pointer arrays, Pointers to Pointers, Initialization of pointer arrays, pointers v/s Multidimensional arrays, command line arguments, Pointer to functions.

Structure and function, Arrays of structures Pointers to Structures, Self- Referential structures, Table lookup, Fields, Union, Typedef.

Standard input and Output Formatting input & output, in memory format conversion, File access, Error Handling, Line I/O.

BSCCS – 02 DIGITAL COMPUTER ORGANIZATION

Representation of Information: Numeric and Nonnumeric, Number Integer and Real Binary, Octal, Hexadecimal, Positive and Negative Numbers Arithmetic in Number systems. Ten's complements,1's and 2's complements, Binary multiplication and Division. characters: ASCII and EBCDC codes, Error detection and Correction Codes: concept, Minimum Distance 3code,Hamming Code.

Basic Logic Design; Logic Gates; AND, OR, Not, BNOR, NAND,EXOR, Introduction to1TL Gates, Truth Table, Boolean , Algebra: Boolean Relational, Sums, Algebraic, Simplification and Minimization of Boolean Full Adder, Decoder, Demultiplexer Encoder, Multiplexers.

Sequential Logic Circuit: Flip-flop: RS Clocked, D, JK, Master Salve Flip flop, Shift register, Shift Left, Shift Right, Bidirectional Shift, Counter: Ripple, Synchronous, RingUp, Down, Memory, type of memory, RAM, Rom, and their Specifications, Secondary Memory Device: Tape, Dist, Floppy, drum, Optical, CD ROM, Magnetic Bubble Memory and charge coupled Devices.

ALU, Register Unit, Control and Timing unit, System Bus, Address bus, Data Bus, Control Bus and utility lines, Accumulator, Generals purpose registers, Special purpose register program counter(PCP, stack Pointer(SP) Status register, Instruction register, index register, memory Address register (MAR) and Memory Buffer Register(MBR).

Input devises: Keyboard, Mouse, Light pen, Joystick, Trackball, Scanner, Voice Input System Output devices: CRT, Printer, Dot matrix, Letter quality, Nonimpack, Inkjet, Laser, Line and Page printers, plotter, Microfilm and microfiche, voice output system. IO Architecture: properties of simple 10 devices and their controller. Transfer of information between I/O device, CPU and Memory, Program controlled and interrupts controlled information transfer.

BSCCS – 03 ELECTRONICS – I

Passive component: Resistors: Symbol, types: carbon, metal filament, wire wound, thin film, Fixed and variable, potentiometers and presets, log and linear type specifications, color code, testing of resistors area of applications problems related to joule heating tolerance temperature coefficient applications in potential dividers coazrse AND FINE PRESETS ETC. Inductors Symbol, type air core iron core, ferrite core frequency response of an inductor specifications measurement of inductance choke AF and RF, their uses and area of applications nagaoka formula for fabrication a single layer coil inductance multi layer coil formula Problems related to a. C. impedance angle between current and voltages power factor. Transformers Principle types (single phase) auto and main transformers Design of mains and step down transformers Simple Idea of AF, IF, RF driver transformers.

Capacitors: Symbol, code, types: mica, paper, ceramic tantalum poly styrene their construction, working and uses, specifications, testing of condenser, area of applications, problems related to electrical en energy stored design of capacitors phase lag resonance in series and parallel to inductor, leakage effects Relays their types Microphones Loudspeakers their types combinations specifications testing and uses in various field problems and exercises related to lout speakers outputs relay currents phase lag maximum switching rates etc.

Switches SPDT, DPDT, Band, switches touch switches thumb wheel switches micro switches specifications and application areas ideal voltage and current source NICD cells.

A.C. Circuits: A.C. current and voltages. RMS and mean value, operator LR, CR, LCR Circuits series and parallel resonance circuits, factor band with coupling circuits coefficients of coupling choke coils, problems and numerical related to power factor, phase relationship between land through band across L at different frequency B, W and Q calculations, variation of 1,V and as a function of frequency.

Circuit Theory: Thevenin's Norten's and Millman's theorems maximum power transfer theorem, reciprocity theorem, problem related to theorems idea of clipper and voltage doubler.

BSCCS – 04 ELECTRONICS – II

Basics of Semiconductors and p-n junction: Conductor, Semiconductors and Insulators, their classification on the basis of Band theory. Intrinsic and extrinsic semiconductors, Fermi level in semiconductors N type and Ptype , current in semiconductors, drift and diffusion-N junction forward and reverse of diode , concept of recombination of carriers temperature variation of forward current and reverse current through the p-n junction. The Rectifier equation, the temperature coefficients, dynamic and junction, the Rectifier equation, the temperature coefficients, dynamic and static resistances, voltage dependent junction capacitance of a p-n junction.

Zener diode characteristics, Zener diode applications, Schottky Barrier hot carrier diodes, Varactor diodes, power diodes, tunnel diodes photo diodes, photoconductive cells. IR emitters, light emitting diode solar cells, thermostats, problems related to nominal voltage of Sneer diode at a certain temperature, Maximum wattage rating. Sneer as regulator range of input voltages for sneer in ON states, capacitance, temperatures coefficient of varactor, its high frequency impedance. Photon energy and coefficient of varactor, its high frequency impedance, photons energy and forward and backward currents in photodiode, thermistor, resistance Chan change solar cell output, relative efficiency of LED, conversion efficiency of solar cell etc.

BJT, their characteristics in different configurations of comparative merits and demerits Biasing of transistors, different methods, Load liner Q-point thermal stability, Transistor as a ON/OFF switch. Transistor as an amplifier in CE, CB, CC and their relations, relativ merits and demerits of each configuration. Current gain, power gain, voltage gain (decibel unit), Analysis of CE amplifier on the basis of input impedance, power gain, emitter follower, Darlington pair and their advantages.

Single stage RC couple amplifier, frequency response class A, class B, class AB, class C, push-pull amplifier, efficiency of class A, B, AB and C amplifier. Applications of these input V/S output waveform analysis in this amplifier, related problems cascading of the amplifier.

Introduction to Silicon Controller Rectifier (SCR) SCR characteristics and ratings, SCR construction and terminal identification's application, Silicon controlled switch, gate turn off, light activated SCR, shockely diode, DIAC, TRIAC, injunction transistor, its construction and characteristics, symbol and its uses as relaxation oscillator

BSCCS – 05 COMPUTER MAINTENACE – I

Electonic Components (Passive Elements)
Working Principles, Symbols, Types, Technical Specifications, Partmeter Value Identification/Measurements Techniques and Application areas for resistors, Indutors, Capacitors, Transformers, Relays, Switches, Cables, Batteries, PCBS, Fuses etc.

Network Theorems: Kirchhoffs Current and Voltage Laws, Maximum Power Transfer Theorem Super Position, Theorem Thevenin's and Norton's theorems.LCR and Wave shaping Circuits: Series and Parallel LCR Resonance Circuits, Low Pass, High Pass, Banc Pass and Band Reject Filters, Clipping and Clamping Circuits, Charging and Discharging of Capacitor in a RC Circuit Concept of Time Constant.

Electronic Components (Active Elements) : Working Principles, Symbols, Types, Technical specifications, Parameter Value Identification and Applications area for PN Junction Diodes-Linear, Varactor, Photodiode, LED, Zener Diode, Opto-Isolators, BIT – Characteristics, Basic Configurations, Biasing, Operating Point, Load Line, Biasing for Stabilization of Operating. Point, UJT, JEET, MOSFET, SCR Dias, Triac.

Amplifiers: Different terms used with Amplifiers, such as Signal, Source, Input, Output, Voltage and Current Gain. Power Gain, Decibel Input Output, Impedance, Classification According to Frequency Response Biasing Point.

Operational Amplifiers: Basic idea of an OPAMP with black box concept, inverting and no inverting inputs, virtual ground, OPAMP parameters, qualitative description of OPAMP applications such as inverting, non inverting summing and difference amplifier, comparator and linear integrator.

BSCCS – 06 COMPUTER MAINTENANCE – II

Generation of Computers (From mechanical to Integrated Circuits), Types of Computers, Digital, Analog, Micro, Mini computers, Main Frames, Working of Computers (Batch Processing System Time Sharing System, On line System, Real Time system), Real Speed of Processors (Mips, Flops, Mhz), Application of Computers (Metrology, Communication, Arts and Cultures etc.).

Introduction to Memory, memory Organization, Types of Memory (RAM, ROM, EPROM, EEPROM), Overview to Floppy disk, Tracks, Sectors, DSDD, DSHD, Calculation of capacity of Disk Introduction to Hard Disk Drive, Magnetic Tape Drives, Disk Operating System (DOS), Introduction to Batch Files, Configuration Files, Com, Exe, Sys, Bin and TXT File. Internal commands (COPY CON, TYPE, DATE, TIME RENAME, CLS, PATH, COPY, MD, CD, RD) External Commands (FORMAT, TREE, MODE, DISKCOPY, CHKDSK, MORE, FDISK, XCOPY, UNDELETE, UNFORMAT).

UNIX: Introduction to UNIX Operation System, Characteristics of UNIX, Difference between DOS and UNIX Operating System, Command MKDIR, REMDIR, CP, LPR, LS, MAIL, WALL, PS, KILL, BANNER, Introduction to VI Editor, ED Editor, Advanced VI Editor.

Introduction to Real Time System, Characteristics of Real time Systems. Introduction to Multimedia, Multimedia Requirements, Introduction to CD-ROM, Introduction to MIDI, and Characteristics of Sound Blaster.

Uses of Computer N/Ws, N/W, l+W Products, Design Issues for Layers, Interfaces and Services, Connection-oriented and Connectionless Services, Primitives, OSI Reference Model, TCP/IP Reference Mode, Comparison of OSI and TCP/IP Model, Knowledge of LAN, S/W used now a days.

LABORATORY

BSCCS – 07 COMPUTER LABORATORY

Practical exercise on programming fundamentals:

1. Simple C programs for exchanging value of Two Variable summation of a set of numbers, Factorial computation.
2. C Program of or Sine function computation, Generation of Fibonacci Sequence, Reversing the digits of an Integer.
3. C program finding of square root of a number, GCD computation, generation of Prime numbers.
4. C program for Computing the Prime Factor of an Integer, Generation of pseudo-random Number, Computing the nth Fibonacci number.
5. C Program for partitioning of an array with reference to a given elements. Finding the kth smallest element finding the Longest Monoton sub-sequence in an array.
6. C program for Binary Search
7. C programs for TEXT line length adjustment, Right and Left Justification of TEXT.
8. C Program for keyword searching in Text, Text line editing Linear Pattern Search.
9. Introduction to Shell Programming for File creation, File merging, files copying.
10. Introduction to Shell Programming in Unix-illustrated by Summation N number, Variable Exchange. Use of IF-THEN Structure, Factorial computation, G.C.D, Computation, Exchanging the Digit of an Integer Comparison of Three Number.

Practical Exercise on Digital Computer Organization Fundamentals:
1-7   Study of Logic Gates AND, OR, NOT, XOR, AND, NOT, XOR.
8-10   Study of JK, FF, D-FF and Tiffs.
11-15 Study of Synchronous, Asynchronous, up, down Counters.
16-20 Study of Demultiplexers, encoder and decoder

BSCCS – 08 ELECTRONICS PRACTICAL LAB

Suggested Experiments
1. To study the sensitivity CRO and their uses.
2. Study the characteristics of Si and Ge diode and determination of bulk resistances. Using high impedance of OP-Amp, based meters.
3. To study the forward and reverse characteristics of Zener diode and determination of its parameters using high Impedance of Op-Amp, based meters.
4. To study half wave and full wave unregulated power supply in the light of its ripple factor and regulation.
5. Study of Zener regulated power supply.
6. Study of I.E. regulated power supply of fixes and variables volts.
7. To study the characteristics of PNP transistor in CB and CE configuration and determination of h-parameters from characteristics.
8. To study the characteristics of NPN transistor in CB and CE configuration and determination of h-parameters form characteristics.
9. Measurements of h-Parameters of transistor by direct method.
10. To study the Emitter Follower.
11. To study the characteristics of SCR and one of its uses
12. To study the integrating and Differentiating Circuits.
13. To study the characteristic of UIT and one of its uses.
14. To fabricate the Transformers with and without Core and compare observed characteristics with the expected values.
15. To study the charging and discharging of condenser in an RC circuit as well as in an RL circuit.

BSCCS – 09 COMPUTER MAINTENANCE LABORATORY

Suggested Experiments Electronics:

1. To study the Horizontal Sensitivity of CRO.
2. To study the Vertical Sensitivity of CRO.
3. Wave shape studies using a CRO.
4. Voltage Measurements using a CRO.
5. To Study half wave and full wave unregulated power supply in the light of its ripple factor and regulation.
6. Study of I.C regulated power supply and Battery.
7. Study of Step Down Transformer.
8. To fabricate Transformers with and without Core and compare observed characteristics with the expected values.
9. To study the charging and discharging of condenser in an RC circuit as well as in an RL circuit.
10. Testing of faulty components using multi meter.
11. To study of LCR resonance circuit and determination of Q factor and band width in both series and parallel cases.
12. Determination of internal resistance of a battery as function of time during its discharge.
13. Kirchoff's Law verification.