

BHARATHIAR UNIVERSITY, COIMBATORE-641 046

B.Sc. PHYSICS WITH COMPUTER APPLICATIONS

SCHEME OF EXAMINATIONS (CBCS PATTERN)

(For the students admitted during the academic year 2014-2015 and onwards)

Part	Study Components	Course Title	Ins. hrs / week	Exam				Credit
				Dur.Hrs.	CIA	Marks	Total Marks	
	Semester I							
I	Language-I		6	3	25	75	100	4
II	English-I		6	3	25	75	100	4
III	Core I – Mechanics, Properties of Matter and Sound		6	3	25	75	100	4
III	Practical I		3	-	-	-	-	-
III	Allied A - Mathematical Paper I		7	3	25	75	100	4
IV	Environmental Studies #		2	3	-	50	50	2
	Semester II							
I	Language-II		6	3	25	75	100	4
II	English-II		6	3	25	75	100	4
III	Core II – Heat and Thermodynamics		6	3	25	75	100	4
III	Practical I		3	3	40	60	100	4
III	Allied A - Mathematical Paper II		7	3	25	75	100	4
IV	Value Education - Human Rights #		2	3	-	50	50	2
	Semester III							
I	Language-III		6	3	25	75	100	4
II	English-III		6	3	25	75	100	4
III	Core III – Optics		4	3	25	75	100	4
III	Practical II		2	-	-	-	-	-
III	Allied - Chemistry I		4	3	20	50	75	3
III	Allied – Chemistry Practical		3	-	-	-	-	-
IV	Skill Based Subject – MS Office		3	3	20	55	75	3
IV	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence)# / Women's Rights #		2	3	50	50	50	2

Semester IV							
I	Language-IV	6	3	25	75	100	4
II	English-IV	6	3	25	75	100	4
III	Core IV – Atomic Physics and Spectroscopy	4	3	25	75	100	4
III	Practical II	2	3	40	60	100	4
III	Allied - Chemistry II	4	3	20	55	75	3
III	Allied – Chemistry Practical	3	3	20	30	50	2
IV	Skill based Subject – Principles of Programming Concepts and C Programming	3	3	20	55	75	3
IV	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness #)	2	3	50		50	2
Semester V							
III	Core V – Mathematical Physics	5	3	25	75	100	4
III	Core VI – Applied Electronics	4	3	25	75	100	4
III	Core VII – Solid State Physics	5	3	25	75	100	4
III	Core VIII– Electricity and Magnetism	4	3	25	75	100	4
III	Practical III - Electronics Alone	3	-	-	-	-	-
III	Elective I - Digital and Micro Processor	4	3	20	55	75	3
III	Elective Practical - Digital and Micro Processor	2	-	-	-	-	-
IV	Skill based Subject – Object Oriented Programming in C++	3	3	20	55	75	3
Semester VI							
III	Core IX – Quantum Mechanics and Relativity	5	3	25	75	100	4
III	Core X - Nuclear Physics	5	3	25	75	100	4
III	Core XI – Numerical Methods	5	3	25	75	100	4
III	Core XII – Fundamental of Nano Materials	4	3	25	75	100	4
III	Practical III - Electronics Alone	3	3	40	60	100	4
III	Elective –II Matlab	4	3	25	75	100	4
III	Elective –III - Practical - Digital and Micro Processor	2	3	20	55	75	3
IV	Skill based Subjects Practical	2	3	30	45	75	3
V	Extension Activities #	-	-	-	-	50	2
Total						3500	140

@ No University Examinations. Only Continuous Internal Assessment (CIA)

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Note : The Syllabus for the above papers (except **Skill Based Papers I-IV, Core Papers XI - Numerical Methods, XII – Fundamentals of Nanomaterials, Elective I – Principles of Digital Electronics and Micro Processors, Elective II – Matlab and Elective III – Practical – Digital and Micro Processor**) be the same as prescribed for the academic year 2010-11. The syllabus for Skill Based Papers I-IV, Core Papers XI – Numerical Methods, XII – Fundamentals of Nanomaterials, Elective I – Principles of Digital Electronics and Micro Processors, Elective II – Matlab and Elective III – Practical – Digital and Micro Processor are furnished below:

SEMESTER III
SKILL BASED SUBJECT I – MS OFFICE

No. of instruction hours: 3 hours

Subject Description: This paper deals with the basics of MS office.

Goal: To learn about the basic concepts of MS word, MS excel and Power point

Unit I (9 hrs)

BASICS OF COMPUTER

Introduction: What is a Computer - Software and Hardware Hardware Components -Hardware Accessories Operating System Software -Software Applications

Computer Network: LAN - Internet - E-Mail – Browsers- E-Mail -- Clients

Unit II (9 hrs)

MS WORD

Setting Page Style - Formmating -Border & Shading –Columns -Header & foot- Setting Footnotes - Inserting manual Page break - Column break and line break.-Creating sections and frames- Inserting Clip arts, pictures, and other files-. Anchoring & Wrapping

Setting Document Styles -.Table of Contents -Index - Page Numbering, data &Time, Author etc., -Creating Master Documents -Web page

Unit III (9 hrs)

MS EXCEL:

Creating worksheet - entering and editing text, numbers, formulas - saving – Excel functions modifying worksheet range selection copying and moving data - defining names - inserting of deleting rows of columns - moving around worksheet naming worksheet, copying inserting of deleting worksheet - formatting, gauging, heading displaying value- changing of selecting fonts, protesting data using style so templates - reprinting worksheet creating charts - managing date - what if tables pate tables wraps, macros, linking worksheets.

Unit IV (9 hrs)

MS POWER POINT

Creating a presentation : Setting presentation style - Adding Text to the presentation

Formatting a presentation: Adding style - Color, gradient fills - Arranging objects - Adding Header & Footer - Slide Background - Slide layout

Adding Graphics to the presentation: Inserting pictures, movies, tables, etc into the presentation - Drawing Pictures using Draw

Adding effects to the presentation:Setting Animation & transition effect - Adding audio and video

Unit V (9 hrs)

MS Access

Introduction: Database concepts - Tables - Queries - Forms - Reports

Opening & Saving database files: Creating Table Design - Indexing - Entering data - Importing data

Creating Queries:SQL statements - Setting relationship - Using wizards

Creating Forms: GUI - Form Creating & printing reports

Text Books:

1. Step by Step 2007 Microsoft Office System (W/CD) by Curtis Frye, Joyce Cox, Steve Lambert
2. Microsoft Office Word 2007 Plain & Simple by Jerry Joyce & Marianne Moon
3. The Unofficial Guide to Microsoft Office Excel 2007 Julia Kelly & Curt Simmons
4. Microsoft Office Powerpoint 2007 Plain & Simple Nancy Muir

Reference books :

1. Microsoft Office Word 2007 Inside Out Microsoft Press Publication
2. Microsoft Office Excel 2007 Inside Out Microsoft Press Publication
3. Beyond Bullet Points: Using Microsoft PowerPoint 2007 Microsoft Press Publication
4. Microsoft Office Access 2007 Inside Out Microsoft Press Publication

SEMESTER – IV

SKILL BASED SUBJECT II PRINCIPLES OF PROGRAMMING CONCEPTS AND C PROGRAMMING

No. of Credit Hours: 3 Hours

Subject Description This subject deals with the programming concepts of C language

Goal To learn about C programming with various features

Objectives

On successful completion of this subject the student should have.

Writing programming ability on scientific and mathematical problems

It is very useful to the students in many ways like their higher studies and research etc., because of its versatility.

UNIT I

(9 hrs)

Introduction – character sets – constants – keywords – and identifiers – variables – variables – data types – declaration of variables – assigning values to variables – defining symbolic constants.

UNIT II

(9 hrs)

Arithmetic operators – relational operators – logical operators – assignment operators – increment and decrement operators – conditional operators – special operators – arithmetic expression – evaluation of expression. – precedence of arithmetic operators – some computer problems – type conversion in expression – operator precedence and associativity – mathematical functions.

UNIT III

(9 hrs)

Reading and writing character – formatted input and output – decision making: IF statement: Simple IF – IF ELSE – Nesting of IF.. ELSE – ELSE. IF Ladder – Switch Statement – operator – go to statement – while .. do while – For loop – Jumps in loops – simple programs.

UNIT IV (9 hrs)

Arrays : Introduction – One dimensional array – declaration of array – Initiating on two and multidimensional arrays – declaring and initializing string variables – reading strings from terminal – writing strings on the screen – Arithmetic operations on characters – simple programs.

UNIT V (9 hrs)

Need for user defined functions – A multifunction program – RETURN values and their types – functions calls – category of functions – no arguments and no return values – simple programs.

Text Book

1. “Programming in ANSI C” by E. Balagurusamy, 3rd Edition

Reference Book

1. Programming in C by Ashok N. Kamthane First Indian Print 2004, Pearson.

SEMESTER – V

SKILL BASED SUBJECT III - OBJECT ORIENTED PROGRAMMING WITH C++

No. of Credit Hours: 3 Hours

Subject Description : This subject deals with the programming concepts of object oriented programming using C++

Goal: To learn about object oriented programming concepts with different features

Objectives

On successful completion of this subject the student should have

Writing program ability on oops concepts like encapsulation, data abstraction, inheritance, polymorphism and overloading etc.

To implement various scientific and mathematical problems with minimum no. of lines.

UNIT I (9 hrs)

Software evolution – Procedure Oriented programming object oriented programming (oop) – Basic concepts benefits of OOP – Object oriented languages – Application of OOP – A simple C++ program – Structure of C++ program- Tokens – Key words- Identifiers and constants Basic data types – User defined Data Types – Derived data types – symbolic constants – Type compatibility – Declaration of variables – Dynamical Initialization of variables – Reference variables – Operators in C++ - Scope resolution operators.

UNIT II (9 hrs)

The main function – Function prototyping – call by reference – Inline functions – Default arguments – Function overloading – Math library functions - classes and objects.

UNIT III (9 hrs)
Constructors and destructors – operator over loading and type conversions

UNIT IV (9 hrs)
Inheritance : Extending classes – Pointers- Polymorphism – pointers to objects – this pointer
pointers to derived classes.

UNIT V (9 hrs)
Virtual functions – pure virtual functions – Managing console I/ o operators.

Text Book

1. “Object Oriented Programming with C++” by E. Balagurusamy, Second edition.
2. Programming with C++, John R. Hubbard, II Edition 2002, TMH Publications

SEMESTER VI - SKILL BASED SUBJECT IV - PRACTICAL

MS WORD

1. Type Chairman’s speech/ Auditor’s report / Minutes/ Agenda and perform the following operations: Bold, Underline, Font Size, style, Background color, Text color, Line spacing, Spell Check, Alignment, Header & Footer, Inserting pages and page numbers, Find and Replace
2. Prepare a Class Time Table and perform the following operations: Inserting the table, Data Entry, Alignment of Rows and Columns, Inserting and Deleting the Rows and Columns and Change of Table Format

MS EXCEL

1. Prepare a statement of Bank customer’s account showing simple and compound interest calculations for 10 different customers using mathematical and logical functions.
2. Prepare a mark list of your class (minimum of 5 subjects) and perform the following operations: Data Entry, Total, Average, Result and Ranking by using arithmetic and logical functions and sorting.

MS POWERPOINT

1. Design presentation slides for a product of your choice. The slides must include name, brand name, type of product, characteristics, special features, price, special offer etc. Add voice if possible to explain the features of the product. The presentation should work in manual mod
2. Design presentation slides for the Seminar/Lecture Presentation using animation effects and perform the following operations: Creation of different slides, changing background color, font color using word art

Programming in C (ANY 5)

1. Find the number of Days elapsed between two dates.
2. Convert Integer in the range 1 to 100 in words.
3. Write a program that uses functions to compare two strings input by user. The Program should state whether the first string is less than, equal or greater than the second Strings.
4. Write a Program to compare two files printing the Character position where they equal and where they are differ.
5. Write a Program for Matrix addition

6. Write a Program for Matrix Multiplication.
7. Write a Program for Addition of Two times
8. Write a Program for find the Inverse of given Matrix
9. Write a Program for display the Multiplication table.

Programming in C++ (ANY 5)

1. To read any two number through the key board and to perform simple Arithmetic Operation (Use Do while loop)
2. To display the name of the day in a week, depending upon the number entered through the keyboard using Switch – case statement.
3. To read the elements of the given two matrix of m X n and to perform the Matrix addition
4. Write a Program for Matrix Multiplication table.
5. Write a Program to find the Inverse of Given m X n Matrix
6. Write a Program to find the Modulus of the Given Number
7. Write a Program to compare two files printing the character position where they are equal and where they are differ.

SEMESTER – VI CORE PAPER XI – NUMERICAL METHODS

No. of Credit Hours: 4 Hours

Subject description : This paper contains the fundamentals of numerical methods.

Goal: It gives logic and programming knowledge to the students

UIT I

(12hrs)

SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS

Linear interpolation methods (method of false position) – Newton’s method – Statement of Fixed Point Theorem – Fixed point iteration: $x=g(x)$ method – Solution of linear system by Gaussian elimination and Gauss-Jordan methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods- Inverse of a matrix by Gauss Jordan method – Eigenvalue of a matrix by power method.

UNIT II

(12hrs)

INTERPOLATION AND APPROXIMATION

Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – Newton’s forward and backward difference formulas.

UNIT III

(12hrs)

NUMERICAL DIFFERENTIATION AND INTEGRATION

Derivatives from difference tables – Divided differences and finite differences – Numerical integration by trapezoidal and Simpson’s 1/3 and 3/8 rules – Romberg’s method – Two and

Three point Gaussian quadrature formulas – Double integrals using trapezoidal and Simpson's rules.

UNIT IV

(12hrs)

INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS

Single step methods: Taylor series method – Euler and modified Euler methods – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne's and Adam's predictor and corrector methods.

UNIT V

(12hrs)

BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

TEXT BOOKS

1. Gerald, C.F, and Wheatley, P.O, "Applied Numerical Analysis", Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 1999.

REFERENCES

1. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2003.
2. Burden, R.L and Faires, T.D., "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.

SEMESTER – VI CORE PAPER XII – FUNDAMENTALS OF NANOMATERIALS

No. of Credit Hours: 4 Hours

Subject Description

This paper presents basic principles of nano materials. This paper gives deep knowledge to the students regarding the nano particles.

Goal

To enable the students to learn the basic principles, theory and concepts of nano mechanics.

Objectives

- To give description for the students in order to
- Learn the size of the particles
 - Acquire basic knowledge of atomic sizes.

Unit 1. INTRODUCTION TO NANOTECHNOLOGY

(12 hrs)

Definition of Nanoscale system – Feymann theory of Nanotechnology – types of nanotechnology – Molecular Nanotechnology – Molecular and atomic size – Surface and dimensional space – opportunities at the Nanoscale.

Unit 2. NANO PROPERTIES

(12 hrs)

Forces between atoms and molecules, particles and grain boundaries – Vander Waals and electrostatic forces between surface – Nano and Mesopores – size dependent variation in magnetic, electronic transport, resistivity, optical and etc – Misnomers and misconception of Nanotechnology.

Unit 3. QUANTUM CONFINEMENT

(12 hrs)

Quantum confinement in one dimension – Quantum wells – Quantum confinement – In two dimensions – Quantum wires – Quantum confinement in three dimensions – Quantum dots – Super lattices band – Band offsets – Quantum dot layers.

Unit 4. SYNTHESIS OF NANOMATERIALS AND ITS CHARACTERIZATION (12 hrs)

Basic approaches of synthesis nanomaterials – Bottom up and top down process – fundamental of sol – gel process – Sol – Gel synthesis methods for oxides – Mechanical milling – thermal evaporation – XRD with Debye scherrer formula – SEM- TEM – FTIR – UV.

Unit 5. APPLICATION OF NANOMATERIALS

(12 hrs)

Implications of Drug delivery – Polymeric Nanoparticles as Drug carriers and controlled release implant devices – Magnetic Data Storage – Magneto optics and magneto – optic recording – Nano Sensors – Physical sensor and chemical sensors.

REFERENCES:

1. Nanotechnology : Basic Science and Emerging Technologies – Mick Wilson, Kamli Kannangara, Geoff Smith, Michelle Simmons, Burkhard Raguse, Overseas Press (2005)
2. Nanotechnology : A Gentle Introduction to the Next Big Idea, Mark A. Rather, Daniel Rather, Mark Rather, Prentice Hall PTR; 1st edition (2002)
3. Robert W. Kel Sall, Mark Geoghegan, In W. Hamley, Nano Scale Science and Technology, John Wiley and Sons, 2005 ISBN 0470850868.
4. Recent advances in the liquid phase synthesis of inorganic nanoparticles Brain L. Cushing, Valdimir L. Kolesnichenko, Charles J. O'Connor, Chem Rev 104 (2004) 3893- 3946.
5. Nano composite science and technology, Palival M. Ajayan, Linda S. Schadles, Paul V. Braues, Wiley – VCH Verlag Weinheim (2003).
6. www.eng.vcedu/engbeaucag/courses/XRD/Neutron_diffraction_atLNL.pdf
7. Nanoparticles as Drug Carriers, Edited by Vladimir P. Torchilin, Imperial College Press, North Einstein University, USA (2006), ISBN 1 – 86094 – 630 – 5.
8. Magnetic materials: Fundamental and device applications Nicholas Ann Spaldin, Cambridge University Press (2003) ISBN 0521016584.

SEMESTER – V ELECTIVE – I
PRINCIPLES OF DIGITAL ELECTRONICS AND MICRO PROCESSORS

No. of credit hours: 4 hours

Subject Description

This paper presents basic principles of digital electronics. This paper gives deep knowledge to the students regarding number system, arithmetic building blocks, memories and data processing circuits.

Goal

To enable the students to learn the basic principles, theory and concepts of number system memories and data processing circuits counters

Objectives

- To give description for the students in order to
 - Learn the logic circuits
 - Acquire basic knowledge of binary addition
 - Understand the action and application of counters
 - Get a deep knowledge of various memories used in computer circuits

UNIT 1

(12 hrs)

Arithmetic Circuits

Binary addition - Binary Subtraction – Unsigned Binary numbers - sign magnitude numbers – 2's complement representation – 2's complement Arithmetic – Arithmetic building blocks – The Adder – Subtractor.

Flip – Flops:

RS flip flop – Clocked RS flip flop – D flip flop – Edge triggered D flip flop – JK flip Flop – JK Master Slave flip flop – Schmitt trigger.

UNIT 2

(12 hrs)

Shift Register and Counters

Types – Serial In Serial Out – Serial In Parallel Out – Parallel In Serial Out – Parallel In Parallel Out – Ring counter – Asynchronous counter – Decoding gates – Synchronous counter – Mod 3 counter – Mod 5 counter – shift counter.

UNIT 3

(12 hrs)

Semiconductor Memories

Basic – Memory addressing – ROM's PROM's and EPROM's – RAM's – DRAM's – Dynamic RAM's.

D/A and A/D Conversion:

Variable – Resistor Network – Binary ladder – D/A converter – A/D converter – Simultaneous conversion – Counter method – continuous A/D conversion

Unit 4 (12 hrs)

Microprocessor and Data Representation

Basic concept – what is Microprocessor, 4, 8, 16, 32 – Organization of Microprocessor – Microprocessor Programming – Instruction – Machine and Mnemonic codes – Machine and Assembly Language Programming – High level Language programming – Timing diagram conventions. Organization of 8085 – Data and Address buses addressing – The I/O devices – Register in 8085– Instruction types – Classification of Instruction – Addressing modes – Programming the 8085 –The Programming process – machine language programming – Assembler Programming.

Unit 5 (12 hrs)

Semi Conductor Memories

Introduction – Registers – Primary memory – Mass storage, cache – off line backup – memory chips – static and dynamic RAMs, ROMs and their versions characteristics of memories :Memory chip capacity and organization – memory size – combining the chips together with example electrical signals. Static RAM : Organisation of 6264 – Read and write cycle of 6264 –dynamic RAMS : Organisation of 51100 x – Read and write cycle of 51100 x RAS only fresh hidden fresh – Burst and distributed i.e., fresh – pseudo static ram and automatic refresh.

Books for Study:

1. Digital Principles and Applications – Albert Paul Malvino & Donald P Leach (Fourth Edition, TMH).
2. Introduction to Microprocessors by Aditya P Mathur (3rd Edition TMH).

Books for Reference:

1. Integrated Electronics – Millmann & Halkeias
2. Microprocessors by Goenkar - Microprocessors by K Ramachandran.

SEMESTER – VI
ELECTIVE PAPER II – MATLAB

No. of Credit Hours: 4 Hours

Subject description: MATLAB is an integrated technical computing environment that combines numerical computation, advanced graphics and visualization and a high level programming language.

Goal: This paper helps the student to solve scientific and numerical problems in an easy and quicker way.

UNIT I (12hrs)

MATLAB windows – Working in the Command Window – Arithmetic operations with scalars – order of Precedence – Display formats – Elementary Math built-in functions – Assignment operator – Rules about variable names

Creating a one dimensional array - Creating a two dimensional array – zeros, ones and eye commands – Transpose operator - Array addressing - adding elements to a matrix – deleting elements – Built – in – functions in handling arrays.

UNIT II (12hrs)

Mathematical operations with arrays : array addition and subtraction – Array Multiplication – array division – element – by – element operations – Relational operations – Logical operations

Trigonometric and exponential functions – character strings - Command line functions, Inline functions – Anonymous functions - Programs.

UNIT III (12hrs)

Script files: Creating and saving a script file – Running a script file – input to a script file – output commands – disp command – fprintf command

Creating a Function File – function definition line – input and output arguments – Local and Global variables – saving a function file

for loops – while loops – if – elseif – else statements – Switch – case – otherwise – break statement – Programs.

UNIT IV (12 hrs)

Conditional statements: if ... end structure – if .. else ... end structure – if .. elseif .. else ... end structure – switch – case statement –

Loops: for ...end loops – while .. end loops - Nested loops and nested conditional statements – break and continue commands.

UNIT V (12hrs)

Two dimensional plots: Plot command line specifiers – Property name and Property value – fplot command

Plotting multiple graphs in the same plot – Formatting a plot: x label, y label, title, legends, text – subscript and superscript - axis command – grid command – formatting a plot using the plot editor

Book for study:

MATLAB An introduction with Applications: Amos Gilat Wiley India Pvt Ltd, New Delhi

Books for reference:

1. MATLAB 7 : Rudra Pratap, 1st edition, 2006, Oxford University Press, 2002 edition
2. MATLAB and its Applications in Engineering : Raj Kumar Bansal, Ashok Kumar Goel and Manoj Kumar Sharma, Published by Dorling Kindersley (India) Pvt Ltd..
3. A guide to MATLAB :Brian R. Hunt, Ronald L. Lipsman and Jonathan M.Rosenberg, Cambridge University Press, 1st edition, reprinted 2003.

**SEMESTER – V ELECTIVE III - PRACTICAL
DIGITAL AND MICRO PROCESSOR
(EXAMINATION AT THE END OF SIXTH SEMESTER)**

ANY TWELVE (12) EXPERIMENTS ONLY

1. Verification of Truth tables of IC gates: OR, AND, NOT, XOR, NOR and NAND.
2. NAND as universal building block- AND, OR, NOT
3. Verification of De Morgan's theorem.
4. Boolean Algebra –problem solving
5. Study of RS Flip-Flop.
6. Study of Shift –Registers –Serial in Parallel out.
7. Decade counter using 7490.
8. Half adder.
9. Full adder
10. Half Subtractor and Full Subtractor.
11. 4 BIT – Binary Adder & Subtractor using 7483.
12. Code converter (Binary to gray and vice versa) & Seven segment Decoder
13. Binary Counter using 7493.
14. Parity check logic.
15. Up/Down Counter using 74190
16. 8085 ALP for 8 bit Addition and Subtraction
17. 8085 ALP for One's Complement, Masking off most significant 4 bits and setting bits.
18. 8085 ALP for Two's compliment Addition and Subtraction
19. 8085 ALP for 8 Bit Multiplication and Division
20. 8085 ALP for finding the Biggest number element in the array and Sum of the elements in the Array