North Maharashtra University, Jalgaon
Class: T.Y.B.Sc. (Semester Pattern)
(W.e.f.June 2009)

In the joint meeting of chairman BOS in all subjects of Science faculty chaired by Hon'ble Dean of Science faculty is held on / / 2009 the revised syllabus for T.Y.B.Sc.(Electronics) is accepted and finalized as per guidelines of Academic Council & with reference to UGC model curriculum. The nomenclature accepted is as follows.

(ELE YSC: Y-Yeaf, S-Semester & C-Course number)

Paper	Semester	Course Code & Title	Periods	Marks Ext.	Int.
1	I	ELE 311: Semiconductor Physics	52	40	10
	II	ELE 321: Electrodynamics	52	40	10
2	I	ELE 312: Basic Communication Systems	52	40	10
	II	ELE 322: Advance Communication System	52	40	10
3	I	ELE 313: Microprocessor I	52	40	10
		ELE 323: Microprocessor II	52	40	10
4	I	ELE 314: Programming in 'C'	52	40	10
	II	ELE 324: Numerical Simulation in Electronics	52	40	10
5	I	ELE 315: Microcontrller 8051	52	40	10
	II	ELE 325: Embedded Systems	52	40	10
6	I	ELE 316: Consumer Electronics	52	40	10
	II	ELE 326: Industrial & Power Electrnonics	52	40	10
7	Annual	ELE 301: General Lab	52	40	10
8	Annual	ELE 302: Microprocessor, microcontroller, C	52	40	10
9	Annual	ELE 303: Project	52	40	10

Note:

1. **Each course is having a weightage of four periods per week.**
2. **Each practical course is having a weightage of four periods per week.**
3. **Examination of practical course shall be held at end of the academic year.**

Chairman, BOS **Dean, Science Faculty**

T. Y. B. Sc. Electronics Paper-I

Semiconductor Physics and Electrodynamics

Semester I ELE 311: Semiconductor Physics

Objectives:

1. To enrich the understanding of fundamentals of semiconductor devices.
2. To have an awareness of fabrication techniques.

Unit 1: Crystal structure

Lattice, basis and crystal structure, translational vectors, unit cell, primitive translational vectors for SC, BCC and FCC co-ordination number, atomic radii, packing for SC BCC and FCC structure, Miller indices, Inter planer distances, Reciprocal lattice and its properties, reciprocal lattice of SC,BCC and FCC lattice. **(12P, 10M)**

Unit 2: Band Theory of Solids

Nearly free electron model, origin of energy bands, electronic motion according to the band theory (effective mass), Distinction between metal, semiconductor and insulator, concept of hole. **(10P, 06M)**

Unit 3: Charge carrier in semiconductor

Semiconductor material (Elemental and Compound), direct and indirect band gap semiconductors, Intrinsic and Extrinsic semiconductor, carrier concentration-Fermi level and Electron-hole concentration at equilibrium, Drift of carriers in electronic and magnetic fields-conductivity and mobility, Hall effect. **(12P, 10M)**

Unit 4: P-N Junction & Integrated circuits

Fabrication of P-N junction, mention different methods of fabrication of P-N junction, Diffusion method, Equilibrium conditions-contact potential, space charge at junction, forward and reverse bias junction-qualitative description of current flow at a junction reverse-bias, break down- Zener and avalanche breakdown. Fabrication of BJT, fabrication of monolithic circuits (introduction) monolithic device elements-merged transistors, MOS transistors (field dropping and channel stops) integration of other circuit elements- resistors, capacitors. **(18P, 14M)**

Reference Books:

1. Fundamental of Solid State Physics– By Saxena, Gupta, 13th Edn 1994, Pragati Publication

2. Solid State Electronic Devices – By Ben G Streetman, 3rd edn 1995, PHI Publication

3. Physics of Electronic Materials – By Kassap

4. Solid State Physics– By S.O. Pillai

T. Y. B. Sc. Electronics Paper-I

Semiconductor Physics and Electrodynamics

Semester II ELE 321: Electrodynamics

Unit 1: Electrostatics

Electric field strength, electrostatic potential, Potential and field due to a dipole. Dipole interactions. Gauss law and its applications. Laplace's & Poisson's equations. Electric force acting on charge conductors in semiconductors. **(12P, 08M)**

Unit 2: Electrostatics in dielectric media

Dielectrics polarization, relative permittivity electric field in dielectric media,$\rightarrow D$,$\rightarrow E$,,$\rightarrow P$ field vectors and their interrelation. Boundary conditions at the interface of two dielectrics. **(10P, 08M)**

Unit 3: Magnetostatics and electromagnetic induction

Magnetic induction, Biot-Savarts law and its applications, Amperes circuital law and its applications. Lorentz force on charges and current carrying conductors. Force between two current carrying coils.$\rightarrow B$, $\rightarrow M$, $\rightarrow H$ vectors and their interrelation, Boundary conditions on $\rightarrow B$ & $\rightarrow H$ at the interface of two media. Hysteresis- retentivity, cohesive force & applications. Susceptibility of magnetic materials. Faradays &Lenz slaws of electromagnetic induction. **(16P, 10M)**

Unit 4: Electrodynamics

Equation of continuity, Displacement current, Maxwells equations in free space, Poyntings vector, Propagation of electromagnetic waves in free space, wave equations in free space, Reflection and refraction of plane electromagnetic waves at non-conducting boundary**. (14P, 14M)**

Reference Books:

1. Electrodynamics – By Gupta, Kumar, Singh, 17th edition-2003 by (Pragati Heonut)
2. Electromagnetics – By B. B. Laud WEL publication
3. Antenna & wave propagation – By K. D. Prasad, Satya Prakashan
4. Introduction to electromagnetic fields and waves – By Corson & Lorrain- CBS

publications
5. Foundation of electromagnetic theory – By Retiz & Milford.

T. Y. B. Sc. Electronics Paper-II

Basic Communication Systems & Advance Communication Systems

Semester I ELE 312: Basic Communication Systems

Objectives:

1. To learn the concepts of communication system.
2. To know the various modulations and demodulations techniques.
3. Conceptual study of T.V. system is expected.

Unit 1: Communication System

Block diagram of Communication system, Function of each block, Modulation, types of modulation, need of modulation. **(6P, 4M)**

Unit 2: Amplitude Modulation & Detection

Principle and mathematical analysis for AM, Modulation index, frequency spectrum, & power spectrum, Transistorized AM modulator, Block diagram of AM Transmitter, AM detector (diode as AM detector), Superhetrodyne Principle, Block diagram of AM Superhetrodyne radio receiver (with waveforms of each block), AM receiver ICTDA1072A (only features). **(14P, 12M)**

Unit3: Frequency Modulation & Detection

Principle and mathematical analysis for FM, FM Modulation index, FM reactance modulator, FM detector (Phase shift discriminator), Block diagram -FM transmitter & receiver, AM/FM Receiver IC -T4258(only features). **(12P, 8M)**

Unit4: Antenna & Wave propagation

Definition of antenna parameter, antenna impedance, Directivity, directional gain, radiation pattern, front to back ratio, types of antenna, half wave dipole, Yagi and dish antenna (description & application)

Types of propagation, ground wave propagation, space wave propagation, ionosphere, sky wave propagation. **(12P, 10M)**

Unit 5: Television Systems

TV fundamentals, Concept of scanning and its types, Composite video signal, Block diagram of color television system and explanation of each block. **(8P, 6M)**

References:

1. Electronic communication – By Roddy & Coolen
2. Electronic communication system – By Kennedy
3. Communication Electronics – By Frensel, McGraw Hill Publication.
4. Antenna and wave propagation – By K. D. Prasad, 3rd edn1996, Satya Prakashan.
5. Electronic communication – By Sanjeeva Gupta, 1998, Khanna Publishers.
6. T. V. fundamentals – By Anil Maini.
7. Monochrome and color TV – By R. R. Gulati, 100, New Age International.

T. Y. B. Sc. Electronics Paper-II

Basic Communication Systems & Advance Communication Systems

Semester II ELE 322: Advance Communication Systems

Objectives:

1. To learn the Fiber optic and Satellite communications.
2. To learn the modern communication.
3. Introduction to computer network.

Unit1: Pulse modulation

Block diagram of Digital communication, Advantages of digital communication, Idea of pulse modulation, Sampling theorem, PAM, PWM, PPM, PCM (Introduction). **(8P, 6M)**

Unit 2: Fiber Optic Communication

Ray theory transmission-Total internal reflection, acceptance angle, Numerical Aperture (Concept only), Optical fiber- Structure, types-Multimode step index fiber,multimode graded index fiber, single mode step index fiber, optical fiber lossattenuation, dispersion, bending loss (no mathematical treatment), splicing techniques & connectors(no construction diagrams), Block diagram of optical fiber communication system, advantages and application of optical fiber cable. **(12P, 10M)**

Unit 3: Satellite Communication

Introduction of satellite communication, transponders, idea of nonsynchronous and geosynchronous or geostationary satellites, geostationary orbit, DOMSAT and INTELSAT, applications of satellite communication. **(10P, 8M)**

Unit 4: Modern Electronic Communication

Idea of FAX system, working of FAX, MODEM and Internet communication, RADAR – principle & working, types, Pulsed RADAR-working, applications of RADAR. **(10P, 6M)**

Unit 5: Introduction to Computer Network

Network, types of network- LAN, WAN, MAN.Network topology- bus, ring, star, tree. Network devices- MUX, Hub, Router, Ethernet card **(12P, 10M)**

References:

1. Optical Fiber Communication–By Keiser, Tata McGraw-Hill International
2. Optical Fiber Communication – By John Senior, Prentice Hall of India
3. Communication Electronics –By Frenzel, Tata McGraw-Hill
4. Electronic communication -Roddy & Coolen,
5. Electronic communication system -By Kennedy
6. Optic Fiber Communication -ByAnuradha Roy
7. Computer networks – By A. Tanenbaum
8. Data Communication- By U.D. Black

T. Y. B. Sc. Electronics Paper-III

Microprocessor I & II

Semester I ELE 313: Microprocessor I

Objectives:

1. To learn the architecture of 8086.
2. To learn the assembly language programming of 16 bit microprocessor.

Unit1: The processor 8086

Register organization of 8086, Architecture, Pin diagram and its functions, Signal Descriptions of 8086, Physical memory organization, General bus operation, I/O addressing capability, activities, concept of stack. **(14P, 12M)**

Unit 2: 8086 Instruction set

Machine language instruction formats, Addressing mode of 8086, Instruction set of 8086**:-** Data Copy / Transfer Instructions, Arithmetic and Logical Instructions, Branch Instructions, Loop Instructions, Machine control Instructions, Flag Manipulation Instructions, Shift and Rotate Instructions, String Instructions. **(14P, 12M)**

Unit 3: Assembler directives and operators

Data Definition and Storage Allocation, Structures, Records, Assigning Names to Expressions, Segment Definition, Program Termination, Alignment Directives, Value-Returning Attribute Operators. **(8P, 4M)**

Unit 4: Programming with 8086

Simple assembly language program, Loop program and String processing program. **(16P, 12M)**

References:

1. Advanced microprocessor and peripherals (Architecture Programming and Interfacing): by A. K. Ray, K. M. Bhurchandi, TMH Publication
2. Microprocessor system: 8086/8088 family (Architecture Programming and design): by Yu Cheng Liu and G.A.Gibson, PHI Publication.
3. Microprocessor and Interfacing: by D. Hall 1995, TMH Publication.
4. The 8088 and 8086 microprocessor (Programming, Interfacing, Software,

Hardware and applications): By Walter A. Triebel, Autar singh.
5. Microprocessor and Interfacing Techniques: By A.P.Godse. D.A.Godse.
Technical Publication, Pune.

T. Y. B. Sc. Electronics Paper-III

Microprocessor I & II

Semester II ELE 323: Microprocessor II

Objectives:

1. To learn the interfacing of I/O devices with microprocessor.

Unit 1: Special Architectural features and related programming

Interrupts and interrupt service routines, interrupt cycle of 8086, NMI and maskable interrupt, interrupt Programming, Macros. Programming using Dos Interrupt: INT 21H (Function 01H, 02H, 09H, 4CH, 10H). **(12P, 10M)**

Unit 2: Basic 8086 Configurations

Minimum and Maximum mode 8086, System Bus Timing. **(6P, 6M)**

Unit 3: I/O Programming

Fundamental I/O Considerations, Programmed I/O, Interrupt I/O, Block transfers. **(6P, 6M)**

Unit 4: I/O interfaces

Serial Communication interface, Asynchronous and synchronous communication, ADC interfacing -0808 Programmable communication interface 8251, Parallel communication interface, 8255 PPI (Programmable Peripheral interface) **(14P, 10M)**

Unit 5: Keyboard and Display Interface Using 8279

Features of 8279, Pin Description, Block Diagram, Operating Modes, 8279 Commands, Interfacing in I/O Mapped I/O, Interfacing in Memory Mapped I/O.

References:

1. Advanced microprocessor and peripherals (Architecture Programming and Interfacing): by A. K. Ray, K. M. Bhurchandi, TMH Publication
2. Microprocessor system: 8086/8088 family (Architecture Programming and design): by Yu Cheng Liu and G.A.Gibson, PHI Publication.
3. Microprocessor and Interfacing: by D. Hall 1995, TMH Publication.

4. The 8088 and 8086 microprocessor (Programming, Interfacing, Software, Hardware and applications): By Walter A. Triebel, Autar singh.
5. Microprocessor and Interfacing Techniques: By A.P.Godse. D.A.Godse. Technical Publication, Pune.

T.Y.B.SC Electronics Paper-IV

Programming in 'C' and Numerical Simulation in Electronics

Semester-I ELE 314: Programming in 'C'

Objectives:

1. To learn the "C" programming language.
2. Development of simple programming in "C" language.

Unit 1: Introduction

Character set, constants, variables, data types, operators, expressions standard input and output statement, declaration statement. **(5P, 5M)**

Unit 2: Making Decision and Looping

The simple if statement, if-else statement, else-if statement, switch, break, continue, nested if, go to statement, for statement, nested for, while statement, do while statement. **(12P, 07M)**

Unit 3: Arrays

Definition, integer array, character array, floats array, initialization array elements, one dimensional array, and multidimensional array. **(05P, 05M)**

Unit 4: Functions and variables

Basics, function arguments and local variables, returning function, results, global variables, automatic and static variables, register variables, external variables, recursive functions. **(10P, 08M)**

Unit 5: Structures and Unions

Structure definition, difference between structure and array, arrays within structure, arrays of structure, function & structures, structure within structures, union, difference between structure and unions. **(10P, 08M)**

Unit 6: Pointers

Definition of static and dynamic memory, definition of pointer, Initialization of pointers, pointers and arrays, pointers and functions, pointers and structures, pointers and pointers, operation on pointers. **(10P, 07M)**

References:

1. "C" Programming - Denis Ritchie.
2. Programming in C – Stephen Kochen.
3. The C- Programming language – Berningham & Ritchie.
4. Programming with ANSI C- Balguruswami.
5. Let us C – Yashwant Kanetkar.
6. Understanding pointers in "C" – Yashwant .P. Kanetkar .BPB Publication.

T. Y. B. Sc. Electronics Paper-IV

Programming with C++ and Numerical Simulation in Electronics

Semester II ELE 324: Numerical Simulation in Electronics

Objectives:

1. To learn the different Numerical methods.
2. Application of numerical methods to electronic circuits.

Unit 1: Roots of Equations

Bisection method, Newton Raphson Method and Secant Method, Problems Based On these methods. **(6P, 4M)**

Unit 2: Numerical Integration

Trapezoidal Rule, Simpson's 1/3rd Rule and 3/8 Rule, Problems based on these methods. **(6P, 4M)**

Unit 3: Numerical Differentiation

First Derivative Formula using Taylor's Series, Finite Difference, Central Difference, Forward Difference and Backward Difference Formula, Second Derivative Formula From Taylor Series, Euler's and Range Kutta Method, Problems based on these methods. **(14P, 12M)**

Unit 4: System of Linear Equations

Gauss Elimination Method, Gauss Jordon, Jacobi, and Gauss Seidal Iteration method, Problems based on these methods. **(14P, 12M)**

Unit 5: Numerical Simulation of Simple Circuits

RC, RL and RLC circuits using differential and integral methods, Loop current analysis using Gauss Elimination Method, Average and RMS value of current using integral methods. **(12P, 08M)**

Reference Books:

1. Computer Oriented Numerical Methods –By V. Rajaraman
2. Introduction to Numerical Analysis- By S. S. Sastry
3. Numerical Methods- By S Balachandra Rao & C K Shantha (University Press)

T. Y. B. Sc. Electronics Paper-V

Microcontroller 8051 & Embedded Systems

Semester I ELE 315: Microcontroller 8051

Objectives:

1. To learn the architecture of 8051 microcontroller.
2. To learn the programming of 8 bit microcontroller

Unit 1: Introduction to Microcontroller

Block diagram of microcomputer (CPU, memory, I/O devices, Buses), Block diagram of microcontroller, Comparison between microprocessor and microcontroller, Microcontroller survey. **(4P, 4M)**

Unit 2: Architecture of 8051 Microcontroller

8051 microcontroller –Block diagram, Features, Pin out diagram, CPU registers, Flags and Program Status Word, Program Counter, Data Pointer, Special Function Registers, Stack & Stack Pointers, Internal RAM /ROM, Oscillator & Clock, External memory, Ports and circuits-Port-0,1,2 & 3,Counter and Timers, Serial data input / output transfers, Interrupts. **(18P, 12M)**

Unit 3: Addressing Modes & Instructions

Addressing modes, External data moves Instructions, Arithmetic Instructions, Logical Instructions, Jump, and Call & Loop Instructions. **(18P, 14M)**

Unit 4: 8051 Microcontrollers Programming

Editor, Assembler, Linker, Instruction syntax, Data types & directive, assembly language programming—simple data transfer, arithmetic, logical, looping, and code conversion programming.

References:

1. The 8051 Microcontroller Architecture, Programming, & Applications-
By Kenneth J. Ayala.
2. The 8051 Microcontroller and Embedded Systems-
By Muhammad Ali Mazidi, Janice Gillispie Mazidi

T. Y. B. Sc. Electronics Paper-V

Microcontroller 8051 & Embedded Systems

Semester II ELE 325: Embedded Systems

Objectives:

1. To learn the 8 bit microcontroller Interfacing.
2. Understanding of basics of PLC & Its programming.

Unit 1: Advanced Microcontroller Programming

Single bit instruction programming

Timer and Counter Programming: Timer modes, Timer Counter registers, Programming the timers in various modes (Mode 1 and Mode2), Counter Programming.

Serial Port Programming: Basic of serial communication(Serial Vs Parallel data transfer, Simplex, Duplex), Serial port of 8051, RS-232 standard and IC MAX-232, Baud rate in 8051, SBUF register, SCON registers, Programming the 8051 to transfer and to receive data serially, Importance of TI and RI flags, Baud rate and Baud rate doubling. **(20P, 15M)**

Interrupts Programming: Interrupts in 8051, enabling and disabling the interrupts, Programming timer interrupts, Programming external hardware interrupts, Level and edge triggered interrupts. TCON register, interrupt priority, IP register.

Unit 2: Real world Interfacing using 8051

Introduction, Interfacing-keyboard (matrix), Displays (seven segment & LCD), stepper motor, ADC, DAC, Temperature Sensor. **(20P, 15M)**

Unit 3: 8051 Interfacing to External Memory

Semiconductor memory, memory address decoding, interfacing with external ROM. **(5P, 04M)**

Unit 4: Programmable Logic Controller (PLC)

Introduction, PLC system, internal architecture of PLC (CPU, Bus, Memory, I/O Unit), PLC Programming- Ladder diagram, ladder programming, logic functions, latching, ladder program, instruction lists, Boolean algebra, functional block diagrams,

programming examples. **(7P, 6M)**

References:

1. The 8051 Microcontroller Architecture, Programming, & Applications- By Kenneth J. Ayala.

2. The 8051 Microcontroller and Embedded Systems-By Muhammad Ali Mazidi, Janice Gillispie Mazidi.

3. The 8051 Microcontroller and Embedded Systems Using Assembly & C-By Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D Mckinlay.

4. Programmable Logic Controllers An Introduction- By W. Bolton

T. Y. B. Sc. Electronics Paper-VI

Consumer Electronics and Industrial & Power Electronics

Semester I ELE 316: Consumer Electronics

Objectives:

1. To study principles required for designing consumer products.
2. Understanding of modern home appliances.

Unit 1: Thermoelectrical and Optoelectrical Transducers:

Thermoelectrical transducer - thermistor, Optoelectrical transducer- Photo cell, Photo voltaic (solar cell), Optocoupler – optical emitter, optical sensor. **(6P, 4M)**

Unit 2: Microphone, Loud speaker and Music Systems:

Microphone: Characteristics of microphone, different types of microphone, Electret & carbon microphones (principle, construction, working and characteristics).

Loudspeaker: Horn type, Multiway speaker system (Woofers & Tweeters).

C.D. Player: Block diagram of CD player and function of each block. **(10P, 10M)**

Unit 3: P.A. System:

Block diagram of P.A. system, typical P.A. Installation planning (P.A. system for a public meeting in Public Park and P.A. System for an auditorium having large capacity) **(8P, 6M)**

Unit 4: Telephone System:

Telephone set, working of phone set, telephone exchange, Initiating call, calling a no., pulse dialing and tone dialing, signal to /from exchange, dial tone, dial back signal and engage signal, making connection, answering call, conversion, ending call, Modems, telex, PBX, PABX, transmitter and receiver. **(10P, 8M)**

Unit 5: Modern Home Appliances:

Microwave Oven - Operating principle, Block diagram, features.

Washing Machines - Operating principle, Block diagram, fuzzy logic, washing machine

with fuzzy logic, features.

Cellular Phones - Operating principle, the cell approach, Block diagram, Functions performed by cell phones, features/specifications.

Electronic Weighing Systems - Operating principle, Block diagram, features / specifications. **(18P, 12M)**

References:

1. Mobile cellular communication- By William C. Y. Lee, 2nd edn 1985, McGraw Hill Publication.
2. Electrical and electronics measurements andinstrumentation- By A.K.Sawhney.
3. Audio and Video systems- By R.G.Gupta, 1988, TMH Publications
4. Modern sound reproduction- By Olson
5. Mobile cellular telecommunications analog and digital system- By Lee.
6. Television- By Gulati, New Age International.
7. Consumer Electronics –By J.S. Chitode, Technical Publications.
8. Modern CD player servicing manual- By Manahar Lotia,BPB Publication.
9. Modern telephone and cordless servicing- By Manahar Lotia, 1st edn 1997, BPB

T. Y. B. Sc. Electronics Paper-VI

Consumer Electronics and Industrial & Power Electronics

Semester II ELE 326: Industrial and Power Electronics

Objectives:

1. To have an idea about Industrial Applications of Semiconductor Devices.
2. To develop the ideas how the semiconductor devices can be used to control various operations in industries as well as the domestic applications.

Unit1: Power Semiconductor Devices

Construction details, symbols, working, principle, I-V Characteristics of following devices: SCR, Diac, Triac, GTO, Light activated Silicon Controlled Rectifier, PUT, Silicon Controlled Switch (SCS), List of applications of SCR.

Ratings: Latching Current, Holding Current, dv/dt & di/dt rating, I^2t rating, surge current rating. **(12P, 10M)**

Unit 2: Turn On and Turn Off circuits for SCR

Introduction to methods of Triggering (Gate triggering, Voltage triggering), Triggering of SCR using UJT, BJT.

Introduction to turn off circuits- Natural & Forced Commutation, types of forced commutation (all classes). **(10P, 6M)**

Unit 3: Inverters and Converters

Inverters- Introduction, Industrial applications, types of inverters, Single Phase Bridge inverter, Single Phase Centre Tapped Inverter, Series Inverter.

Converters (choppers) - Introduction, Principle of Step down Chopper (variable frequency and constant frequency control), Step up chopper, Chopper Classification, Chopper Configurations. **(12P, 10M)**

Unit 4: High frequency heating

Induction heating- principle, theory and applications. Dielectric heating - principle, theory and applications. **(8P, 6M)**

Unit 5: Industrial Applications of SCR

Uninterruptible power supplies, over voltage protection, simple battery charger, automatic battery charger, fan regulator using Triac, Emergency light system. **(10P, 8M)**

References:

1. A Text Book on Power Electronics-By H.C. Rai Galgotia Publication,
2. Power Electronics- By H.C. Rai, 3rd edn 1999 Galgotia Publication
3. Industrial Electronics – By G.K.Mithal, 18th edn 1998, Khanna Publishers
4. Text Book of Industrial Electronics- By Joshi, Rao, Sutrave, 2nd edn 1998, Nirali Prakashan.
5. Thyristor & Their Applications- By M. Ramamoorty, 2nd edn 1999, EWP.

T.Y.B.SC Electronics Paper-VIII

Practical Course

ELE 302: Microprocessor, Microcontroller and C programming

A) Microprocessor Practical (perform any eight practical)

1. To display A to Z with one space and ten character in one line.
2. To display A to Z on one line 0 to 9 on next line
3. To display complete character set with 25 character on one line.
4. To change upper case to lower case / lower case to upper case.
5. To remove input string of character.
6. To find largest / smallest number asset of entered numbers.
7. Find sum of entered numbers.
8. To read single digit hexadecimal number and multiply it by 8 without MUL instruction.
9. Line drawing on a screen.
10. To change entered numbers in ascending / descending order.
11. To generate n Fibonacci numbers.
12. To find factorial of a given number.
13. Interfacing of a stepper motor.
14. Interfacing of relay

B) Microcontroller Practical (perform any four practical)

1. Write a number of addition / subtraction of two 8 bit numbers and store the results.
2. Write a program for multiplication / division of two 8 bit numbers and store the result in AX register.
3. Write a program to add strings of byte and store in memory.
4. Write a program to count no. of character stored in string which is terminated by escape character.
5. Write a program to convert 8 bit decimal no. into hexadecimal form.
6. Write a program to convert hexadecimal no. into BCD form.

Interfacing:

1. Write a program to ON / OFF simple switch continuously.
2. Write a program to make LED ON and OFF continuously.
3. Write a program to drive stepper motor continuously.
4. Write a program to generate square wave.

C) C Practical (Perform any four Practical)

1. Write a program to find roots of equation f(x) = 0 using Bisection/Newton Raphson method.
2. Write a program to find out integration of function Simpson's 1/3 OR 3/8 rule.
3. Write a program to find derivative of function using Euler's / Runge Kutta method.
4. Write a program to generate the first n Fibonacii numbers using array.
5. To find roots of a given quadratic equation.
6. Write a program (a) to get sum of digits, (b) to reverse digits of given number.
7. Write a program to calculate factorials of positive n integer numbers using recursive function.
8. Write a program to generate n prime numbers starting from any prime number.
9. Write a program to find GCD and LCM of two given numbers.

T. Y. B. Sc. Electronics Paper-IX

ELE 303: Project

Student should do a project during the year and submit project report at the time of examination. The distribution of marks is as follows:

1. Duration	10M
2. Library work	20M
3. Experimental skill & theoretical understanding	20M
4. Presentation & Project report	20M
5. Oral	10M
Total	**80M**