

SEMESTER SYSTEM, 2008

PROPOSED SCHEME FOR B.Sc. (ELECTRONICS), B.Sc. (ELECTRONICS MAINTENANCE)

CLASS/ SEMESTER	B. Sc (Elex)	B. Sc (Elex. Maint)	CC E 30%	Min Marks	Term End Exam (70 %)	Min Marks	Total 100%	Min marks
Sem-III    Hons.->	EL-2101 Op-Amp & its Application	EL-2101 Op-Amp & its Applications	15	5	35	12	50	17
	EL-2102 Digital Electronics II	EL-2102 Digital Electronics II	15	5	35	12	50	17
	EL-2103 Practical	EL-2103 Practical	-	-	-	-	50	17
	EL – 2104 Semester Project - III	EL – 2104 Semester Project - III	-	-	-	-	50	17
	EL-2105 Linear Circuits		15	5	35	12	50	17
Sem-IV    Hons.->	EL-2201 Microproces sors	EL-2201 Microprocess ors	15	5	35	12	50	17
	EL-2202 Computer Networks	EL-2202 Computer Networks	15	5	35	12	50	17
	EL-2203 Practical	EL-2203 Practical	-	-	-	-	50	17
	EL – 2204 Semester Project - IV	EL – 2204 Semester Project - IV	-	-	-	-	50	17
	EL-2205 Fundament als of Computers		15	5	35	12	50	17

**Note:**

1. CCE – Continuous Comprehensive Evaluation
2. Individual passing required for theory and practical subjects.
3. Semester Project III – IV shall be of 50 hours duration and evaluation of the project work shall be done as per instructions of Department of Higher Education.

# **EL-2101**

## **OP-AMP & ITS APPLICATIONS**

### **Unit I : OP-AMP Fundamentals**

Basic building blocks of Op-Amp, Differential Amplifiers, Types of Differential Amplifiers: Their DC and AC Analysis, Concept of Virtual Ground. Current mirror biasing & Current mirror loading.

### **Unit II : OP-AMP Parameters**

Characteristics and concepts of an ideal Op-Amp, Input offset voltage, Output offset voltage, Input offset current, Input bias current, CMRR, PSRR, and Slew Rate. Open loop gain, Input resistance and Output resistance, Frequency response, Characteristics of Op-Amp IC 741 & IC 324, Calculation of CMRR and Slew Rate.

### **Unit III : Linear Applications of OP-AMP**

Voltage Amplifier: Inverting and Non Inverting, Summing amplifier, Current Sources, Differential and Instrumentation Amplifier. Problems related to above topics.

### **Unit IV : Non Linear Applications of OP-AMP**

Comparators, Zero Crossing Detector, Limit Detector, and Window comparator, Schmitt Trigger, Differentiator and Integrator, Logarithmic Amplifier. Problems related to above topics.

### **Unit V : Active Filters**

Active Filter & Advantages over Passive Filters, Introduction to Butterworth and Chebyshev Approximations, Design of First and Second order low pass, High pass, Band pass and Band stop Filters. Notch and All pass filter. Problems related to design of filters.

### **BOOKS RECOMMENDED:**

1. Operational Amplifier : Ramakant Gaikwad
2. Linear Integrated Circuits : D. Roy Choudhary & Shail B. Jain

**Note:** The question paper will have the usual Note saying “Attempt five questions choosing one from each unit”. Thus the paper will clearly specify units and have a pattern of two questions per unit with an option to attempt any one of these two within each unit. The balance of paper will be maintained by including appropriate (Numerical / Objective / Conceptual / Analytical / Theoretical) combination of subsections in each question.

# EL-2102

## DIGITAL ELECTRONICS -II

### Unit I: TTL Circuits

TTL Circuits, Digital Integrated Circuits: 7400 Series, TTL Characteristics, TTL Overview, Open Collector & Totem Pole Outputs, Difference between TTL types including Schottky, Low power Schottky, Standard and Low Power TTLs. Introduction to MOS Logic Family, Comparison between TTL and MOS Families.

### Unit II: Latches & Flip Flops

RS and D-Latches, RS Flip-Flop, Edge triggered D, JK and T Flip-Flop. Concept of Racing and JK Master Slave Flip Flops.

### Unit III: Registers

Buffer Registers, Shift Registers, Controlled Shift Registers.

### Unit IV: Counters

Ripple Counters, Synchronous Counters, Ring Counters, Synchronous and Asynchronous loading of the Counters, Clear and Preset in the counters.

### Unit V: Converters

**Basic D/A Converters:** R-2R, Binary Weighted Resistor type, **A/D Converters:** Counter, Ramp, Flash and Successive Approximation. **Sample and Hold Circuits:** Basic Concept and Working.

### BOOKS RECOMMENDED:

1. Digital Principles and Applications : Malvino and Leach
2. Modern Digital Electronics : R.P. Jain
3. Digital Computer Electronics : Malvino and Brown

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# **EL 2103 PRACTICAL**

## **SEMESTER III**

### **SCHEME OF PRACTICAL EXAMINATION**

1. Op-Amp 741C as an inverting and non- inverting amplifier.
2. Op-Amp 741C as adder and Subtractor.
3. Op-Amp as Voltage Comparator.
4. Op-Amp as Active Filters.
5. Op-Amp as Differential and Instrumentation Amplifier.
6. Op-Amp as Integrator and Differentiator.
7. Study of R-S, D and J-K flip flop.
8. Study of 4 - Bit Ripple Up/Down Counter.
9. Study of Left and Right Shift Registers.
10. Study of Digital Comparator.
11. Study of D/A Conversion.
12. Study of A/D Conversion.
13. Study of Ring Counter and Decade Counter.

# EL 2105 (HONOURS)

## LINEAR CIRCUITS

### Unit I : OP-AMP Applications

Precision Half Wave and Full Wave Rectifiers, Peak Detectors, Clipper and Clamper Circuits, Sample and Hold Circuits, V to I & I to V converters, Multiplier and Divider, Log & Antilog Amplifier. Problems related to above topics.

### Unit II : OP AMP as Waveform Generators

Introduction, OP AMP as Sine, Triangular, Square wave & Pulse generator.

### Unit III : 555 Timer & its Applications

Introduction, Description of Functional Diagram, Monostable Operation, Astable Operation, Schmitt Trigger. Problems related to above topics.

### Unit IV : Voltage Regulators

Introduction, Series Op-Amp regulator, IC voltage regulator, 723 general purpose regulator, switching regulator. Problems related to above topics.

### Unit V : Phase Locked Loop

Introduction, Basic Principles, Phase Detector/ Comparator, Voltage Controlled Oscillator (VCO), Low Pass Filter, Monolithic PLL, PLL Applications. Problems related to above topics.

### BOOKS RECOMMENDED:

1. Operational Amplifier : Ramakant Gaikwad
2. Linear Integrated Circuits : D. Roy Choudhary & Shail B. Jain

**Note:** The question paper will have the usual Note saying “Attempt five questions choosing one from each unit”. Thus the paper will clearly specify units and have a pattern of two questions per unit with an option to attempt any one of these two within each unit. The balance of paper will be maintained by including appropriate (Numerical / Objective / Conceptual / Analytical / Theoretical) combination of subsections in each question.

# EL 2201

## MICROPROCESSORS

### UNIT I : Microcomputers, Microprocessors

Microprocessor architecture and Microcomputers System, 8085 based Microcomputer system. Architecture and Pinout diagram of 8085, ALU and Control Unit, Microprogramming, Concept of Fetch cycle, Execution cycle, Machine cycle and Instruction cycle.

### UNIT II : Assembly language Programming

Introduction to 8085 basic Instructions: Data transfer, Arithmetic & Logical, Branch, I/O and Machine Control Instructions and their Timing diagrams, Addressing modes, Looping, Counting and 16 bit Arithmetic instructions.. Assembly Language Programs related to above topics.

### UNIT III : Stack and Subroutines

Stack, Stack Pointer, Stack related instructions: PUSH, POP, XTHL, XCHG, SPHL, etc.; Subroutines, Unconditional/Conditional Call and Return instructions, Code conversion, BCD Arithmetic. Assembly Language Programs related to above topics.

### UNIT IV : Interrupts

Hardware and Software, Maskable and Non Maskable, Vectored and Non Vectored Interrupts. Priority of Interrupts and Interrupt Service Subroutines.

### UNIT V : Memory & I/O Interfacing

Memory: Primary & Secondary Memory, Memory Mapping, Serial and Parallel I/O & Memory Interfacing with 8085, Programmable I/O and DMA, Memory Mapped I/O and I/O Mapped I/O techniques.

### BOOKS RECOMMENDED:

1. Digital Computer Electronics : Malvino
2. Microprocessor Architecture ,Programming and : R S Gaonkar  
Applications with 8085

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## **EL 2202**

### **COMPUTER NETWORKS**

#### **Unit I : Introduction**

Introduction to Data and Network Communications, Telephone System, Error Detection and Correction.

#### **Unit II : OSI Model and Physical Layer**

OSI Architecture, OSI Physical Layer Components, Higher Capacity Data Communication..

#### **Unit III : Data Link Layer Protocols**

Introduction, Data Link Sections, Character Oriented and Bit Oriented Protocols. Network Architecture and Protocols.

#### **Unit IV : ISDN and Routing Protocols**

Introduction, Integrating Services, Broadband ISDN, DSL, ATM, Frame Relay.

#### **Unit V : Internet and TCP/IP**

Introduction, Internet: Uses, Access, Addresses and Security issues, TCP/IP.

#### **BOOKS RECOMMENDED :**

1. Data and Network Communications : Michael A Miller; Delmar Thomson Learning, Inc.

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# **EL 2203 PRACTICAL**

## **SEMESTER IV**

### **SCHEME OF PRACTICAL EXAMINATION**

#### **Using Microprocessor 8085**

1. Addition and Subtraction of 8 bit Numbers
2. Addition and Subtraction of 16 bit Numbers
3. Addition of 8 bit numbers in BCD code
4. Addition of two string of numbers placed in memory location
5. Multiplication and Division of 8 bit and 16 bit numbers.
6. Find the Largest and Smallest number from a given set of numbers loaded in the memory
7. To arrange the numbers in Ascending and Descending order
8. Find 1's & 2's complement of numbers
9. Block Data Transfer in Memory
10. Display 'HELP'

# EL 2205 (HONOURS)

## FUNDAMENTALS OF COMPUTERS

### UNIT I :

Computer generation and Classification: First Generation, Second Generation, Third Generation, Fourth Generation, Fifth Generation computers, Block Diagram of computer, algorithms. Flow chart, stored program concept, working of a computer, word length & processing speed of a computer, user interface. Hardware, Software and Firmware concepts, Microprocessor and single chip microcomputer concept.

### UNIT II :

Input and Output Units, Floppy disk, Hard disk, Keyboard, Mouse, Joystick, Scanner, Serial printers, Letter quality printers, Plotters, Laser printers, Graphic display device, Input output port, serial port, serial data transfer, programmable interval timer/counter, supporting peripherals.

### UNIT III :

Computer memory, memory cell, Memory organization, Read only memory, Random access memory, PROM, EPROM, EEPROM, serial access memory. Magnetic hard disk & Floppy disk driver, magnetic tape drives, cache memory, memory controllers, optical disks, program and data memory. Memory Management unit.

### UNIT IV :

Distributed Processing or multiprocessing, Batch processing, Multiprogramming and Multiuser system, Dumb and smart terminals. Computer network, Local Area Network, Parallel Processing, central processing unit.

### UNIT V :

Operating System: Introduction to operating system in a computer. Batch operating system, Multiprogramming operating system. Time sharing operating system, On time and real time operating system. Basic commands of UNIX.

### BOOKS RECOMMENDED :

1. Computer Fundamentals, Architecture and Organization : B. Ram
2. Computer Architecture and Organization: Nicholas Carter, Second Edition, TMH (Adaptation) Schaum Series, 2009
3. UNIX Manual

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