

B.Sc. Electronics Syllabus
Semester V – Paper 5
EL-501T COMMUNICATION-I

UNIT 1

07 hours

Noise and Transmission lines

Noise-Introduction, internal and external noises, signal to noise ratio and noise figure-numerical examples.

Transmission lines - types and equivalent circuit of T-lines, primary and secondary constants. reflection co-efficient, VSWR and CSWR-numerical examples, losses and distortions in T-lines. propagation of waves-ground wave, sky-wave and space wave propagations, ionosphere and its effects.

UNIT 2

10 hours

Analog Modulation techniques

Block diagram of electronic communication system. modulation-need and types of modulation-AM, FM & PM. Amplitude modulation – representation, modulation index, expression for instantaneous voltage, power relations, frequency spectrum, DSBFC, DSBSC and SSBSC (mention only), AM collector modulator. Limitations of AM. FM - definition, modulation index, FM frequency spectrum diagram, bandwidth requirements, frequency deviation and carrier swing, FM generator-varactor diode modulator. Block diagram of AM transmitter and FM transmitter with AFC, qualitative study of pre-emphasis. Comparison of AM and FM, numerical examples.

UNIT 3

09 hours

Radio Receivers

Demodulation- AM detection – principles of detection, linear diode and Transistor detector-circuits, principle of working and waveforms. FM detector – principle, slope detector-circuit, working. AM superheterodyne receiver– principle, block diagram, function of each stage with waveform, qualitative study of AGC. FM superheterodyne receiver– principle, block diagram, function of each stage with waveform, qualitative study of de-emphasis. Characteristics of radio receivers-qualitative study of sensitivity, selectivity, signal to noise ratio, fidelity, stability, image frequency and its rejection.

Unit 4:

08 hours

Antennas

Radiation mechanism, wire Radiators in space-resonant antennas-radiation pattern and current distribution for different lengths, non - resonant antenna, antenna parameters-gain, directive gain, power gain, bandwidth, beam width, polarisation, efficiency, radiation resistance, total effective resistance, derivation for the power radiated by antenna and expression for radiation resistance. Ungrounded and grounded antennas, effect of antenna height. Folded dipole, numerical examples wherever applicable. Qualitative study of helical antenna and loop antenna.

Unit 5

08 hours

Television

Introduction, scanning, interlaced scanning, T.V. camera tube (vidicon), composite video signal – blanking and synchronizing pulses, vestigial side band transmission, TV systems and standards – comparison between American and European systems. Block diagrams of monochrome TV transmitter and receiver. basic principles of colour TV, primary and

secondary colours, colour combinations, chromo and luminance processing as per PAL system. Colour TV receiver (PAL). Concept of CCTV, HDTV, Picture in Picture, Picture phones, TV games, numerical examples wherever applicable.

Text Books:

1. Electronic Communication, George Kennedy, 3rd edition, TMH.
2. Electronic Communication, Roddy and Coolen, 4th edition, PHI.

Reference Books:

3. Electronics Communications Systems, Wayne Thomasi, 5th edition, Pearson Ed.
4. Digital Communication System : Ronald J. Tocci

Semester V - Practical V
EL-501P COMMUNICATION LAB

1. Amplitude modulator and Amplitude demodulator
2. FM modulator using IC8038
3. Pre –emphasis and De- emphasis
4. Three way Audio cross over network.
5. IF amplifier
6. Class C tuned amplifier
7. AGC
8. VCO using IC 566
9. Frequency mixer
10. Time Division Multiplexing and de multiplexing
11. Frequency Multiplier
12. Study of Sensitivity, Selectivity and Fidelity of an AM radio receiver

Note: Minimum of 8 experiments to be performed.

B.Sc. Electronics Syllabus

Semester V – Paper 6

EL-502T MICROPROSSESOR and ELECTRONIC INSTRUMENTATION

UNIT 1:

09 hours

Introduction to Microprocessor

Introduction, applications, basic block diagram, speed, word size, memory capacity, classification of microprocessors (mention different microprocessors being used)

Microprocessor 8085: Features, architecture –block diagram, internal registers, register pairs, flags, stack pointer, program counter, types of buses. Multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085.

8085 Instructions-Operation code, Operand & Mnemonics.

Instruction set of 8085, instruction classification, addressing modes, instruction format.

Data transfer instructions, arithmetic instructions, increment & decrement instructions, logical instructions, branch instructions and machine control instructions.

UNIT 2:

09 hours

Stack operations and Microprocessor Programming

Stack operations, subroutine calls and return operations. Delay loops, use of counters, timing diagrams-instruction cycle, machine cycle, T- states, time delay-numerical examples.

Programs for data transfer and memory operations (direct & indirect addressing), addition and subtraction of two 8-bit & 16- bit numbers, multiplication, display of smallest / largest number in a given array of numbers, sorting of numbers in descending / ascending order. Number of 1's and 0's in a given byte, testing for zero condition. 1's and 2's complements. Verification of truth tables of logic gates, program to add two N byte numbers, program to generate Fibonacci series up to the limit, program to find the factorial of a number, program to find the GCD of two integer numbers.

UNIT 3:

08 hours

I/O instructions and Interfacing

I/O instructions and, interrupts in 8085. Basic interfacing concepts, compatible ICs of μP 8085, data transfer, synchronous I/O data transfer using interrupts.

Memory interfacing – address decoding, interfacing RAM and ROM.

Interfacings I/O devices– input port, output port, IN & OUT instructions, interfacing input devices (interfacing matrix key board-block diagram), interfacing output devices (LED display interfacing-block diagram).

PPI IC 8255– features, pin diagram, functional block diagram, ports & their modes.

UNIT 4:

08 hours

Measurement systems, Transducers & Electronic Instrumentation

Introduction to general measurement system – characteristics - definition –static & dynamic.

Transducers, types – resistive, capacitive and inductive transducers, strain gauge, LVDT (variable inductive transducers) temperature transducers- thermo couple, thermistors – ultrasonic temperature transducer, photoelectric transducers, pressure transducers-MIC and and loud speaker, signal conditioning (concept only), amplifier – chopper amplifier –carrier amplifier - lock in amplifier.

UNIT 5:**08 hours****Introduction to Bio-medical instruments**

Origin of bio-electric signals, resting & action potential – propagation, physiological transducers – active & passive transducer for medical application – diagnostic & analytical equipments -electrodes for ECG, EEG, and EMG, block diagram of ECG and EEG systems.

Text Books:

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S.Gaonkar - Wiley Eastern Limited- IV Edition.
2. Fundamentals of Microprocessor & Microcomputer: B. Ram—Danpat Rai Publications.
3. Instrumentation devices and systems: Rangan, Sarma, Mani, TMH
4. Handbook of biomedical instrumentation: Khandpur R S, TMH
5. Electronic Instrumentation- H. S. Kalsi, TMH, 2004

Reference Books:

1. Microprocessor and Interfacing- Programming & Hardware, Douglas Hall, TMH, 2nd edition, 1991
2. Modern Digital Electronics, R.P. Jain—TMH—2nd Edition.
3. Microprocessor and its Applications- R.Theagarajan, S. Dhanasekaran and S. Dhanapal—New Age International Publishers.
4. Microprocessors and Microcontrollers-B.P singh, Galgotia publications.
5. The Intel Microprocessors 8086/8088, 80186, 386, 486, architecture, Programming and interfacing – Barry. B. Bray, PHI, New Delhi.
6. Microprocessor Lab Manual- G.T Swamy- Lakshmi Publications 2006.
7. Instrumentation Measurement and analysis: Nakra B C, Chaudry K K, TMH
8. Measurement systems applications and design: Doebelin E O, McGraw Hill, 1990.
9. Electron measurements and instrumentation techniques: Cooper W D and Helfric A D, PHI, 1989.
10. Biomedical instrumentation and measurements: Leslie-Cromwell, Fred J Weibell, Erich A Pfeiffer, PHI, 1994.
11. Instrumentation, Measurement & Feedback by Barry Jones, PHI
12. Electronic Instrumentation and Measurements, David A Bell, PHI / Pearson Education, 2006.
13. Electronics & electrical measurements, A K Sawhney, Dhanpat Rai & sons, 9th edition.
14. Biomedical Instrumentation - M.Arumugham, Anuraçlha Agencies
15. Bio Medical Instrumentation Engineering – Leslee and Chronewell.

Semester V - Practical VI

EL-502P 8085 Microprocessor programs and Interfacing

1. Program to add (with carry) 8 bit numbers - Binary and BCD
2. Program to subtract two 8 bit numbers - Binary and BCD
3. Program to add & subtract two 16-bit numbers (with carry).
4. Program to multiply two 8-bit numbers.
5. Program to find GCD of two numbers.
6. Program to find the ratio (division) of two 8-bit numbers.
7. Program to find the number of 1's & 0's in a given byte and program to display the smallest number in a given array of numbers.
8. Program to sort the given array of numbers (descending order) and to find the smallest number.
9. Program to display decimal up counting (00-99).
10. Program to verify the truth table of logic gates.
11. Interfacing 20 keys matrix keyboard
12. Interfacing seven-segment display
13. Interfacing DAC card to convert digital input to equivalent analog output (preferably using IC DAC 08 and IC 741)
14. Interfacing a stepper motor.

(Any EIGHT Experiments – any two interfacing experiments compulsory)