Swami Ramanand Teerth Marathwada University, Nanded
B.Sc. Second Year Electronics Syllabus
To be Implemented from academic year 2009

Paper No.	Name of the paper	Theory Marks	Practical Marks	Period per week
IV	Amplifiers, Oscillators and Wave Shaping Circuits	100		03
V	Fundamentals of Microprocessor and Interfacing	100		03
VI	Practicals		100	03
VII	Practicals		100	03
		Total=400	Total=200	Total=12

Total Theory marks =200
Total Practical marks =200
Total Theory + Practical =400

Paper-IV: Amplifiers, Oscillators and Wave Shaping Circuits

100 Marks

Unit I:

Small Signal Amplifiers:

Fixed bias, voltage divider bias, collector feed back bias, h-parameters, transconductance model, CE amplifier, CB amplifier, CC amplifier. (Formulas for voltage gain Av, current gain Ai, power gain, input impedance R_i and output impedance R_o) (15 periods)

Unit II:

Sine wave Oscillators:

Introduction to positive and negative feed back, requirement of an oscillator, Barkhausen criterion, Hartley oscillator, Colpitt's oscillator, R-C network, Phase shift oscillator, Wien bridge oscillator (Derivation of frequency and condition for oscillation) (20 periods)

Unit III:

Multivibrators:

Transistor as a switch, Transistorized astable multivibrator, monostable multivibrator and bistable multivibrator (Qualitative and quantitative analysis).

Sweep circuits: Introduction, sweep voltage waveforms, exponential sweep, RC ramp generator. (15 periods)

Unit IV:

Operational Amplifiers:

Theory of differential amplifier, block diagram of Op-Amp, schematic symbol, ideal characteristics, input offset voltage, input offset current, input bias current, input impedance, out put impedance, open loop gain, CMRR, slew rate.

Applications of Op-Amp.:

Inverting amplifier, non-inverting amplifier, Op-Amp as adder, Op-amp as subtractor, Op-amp as integrator, Op-amp as differentiator, Op-amp as comparator, Op-amp as Schmitt's trigger, solving differential equation. (25 periods)

Unit V:

Block diagram of IC555, IC 555 as astable multivibrator, IC555 as monostable multivibrator, IC566 (pin diagram, block diagram and use as VCO). (05 periods)

References:

1. Introduction to Electronics-K.J.M.Rao, Oxford and IBH Publishing Co.
2. Sold State Pulse Circuits-David A Bell, Fourth edition, Prentice-Hall of India Private Limited.
3. Op-Amps and Linear Integrated Circuits-Ramakant Gayakwad, Prentice-Hall of India Private Limited.
4. Electronics and Radio Engineering-M.L.Gupta, Dhanpat Rai and sons.
5. Digital and Analogue Techniques-Navneet, Gokhale and Kale, Kitab Mahal
6. Linear Integrated circuits-K.C. Botkar
7. Basic Electronics(Solid State)- B. L. Theraja, S. Chand & Company Ltd.

Paper-V: Fundamentals of Microprocessor and Interfacing

100 marks

Unit I: (15 periods)

Introduction:

Semiconductor memories (RAM, ROM, PROM, EPROM, EEPROM), Block Diagram of Microcomputer, Software Concepts, Architecture of 8085, Functional Pin Configuration of 8085, Description of ALU, Register Control Unit and Data/Address Bus, Features of 8085.

Unit II: (20 periods)

Instruction Set of 8085:

Instruction Format (1 byte, 2 byte,3 byte), Addressing Modes, Classification of Instruction set, Instruction set of 8085.

Unit III: (20 periods)

Programming on 8085:

Program based on Data transfer, Arithmetic, Logical, Branch, I/O Machine Control Group.

Unit IV: (15 periods)

Interrupts:

8085 Interrupts and data transfer techniques, Types of Interrupts, Priority Structure, Microprocessor Controlled data transfer, DMA Controlled data transfer, A/D Converter, D/A Converter.

Unit V: (10 periods)

Interfacing ICs:

8255, 8253, 8279 and 8257, Schematic diagram(functional pin diagram), Internal Block Diagram & operating modes.

References:

1. Fundamentals of Microprocessors and Microcomputers-B.Ram, Dhanpat Rai Publications
2. Microprocessor-Borole and Vibhute, second edition, Technova Publications.
3. Microprocessor Architecture, Programming and Applications with the 8085 – Ramesh S. Gaonkar, third edition, Penram International Publishing.

Paper-VI: Electronics Practicals

100 Marks

Note: (i) Every student must perform atleast 10 experiments not less than **Five** from each group.
(ii) Use graphs wherever necessary

Group I:

1. Study of transistorized CE amplifier(Frequency response, gain & 3db band width.)
2. Op-Amp as inverting amplifier(Study of DC gain verification)
3. Op-Amp as Inverting amplifier(Study of frequency response, gain & 3db band width)
4. Op-Amp as Non inverting amplifier.(Study of frequency response, gain & 3db band width)
5. Op-Amp as adder
6. Op-amp as subtractor.
7. Op-amp as integrator
8. Op-amp as Schmitt's trigger
9. Op Amp as comparator

Group II:

10. Transtorized Hartely oscillator. Measurement of frequency and amplitude of waveforms.
11. Transtorized Colpitt's oscillator. Measurement of frequency and amplitude of waveforms.
12. Transtorized Phase shift oscillator. Measurement of frequency and amplitude of waveforms.
13. Wein Bridge oscillator using Op-Amp.. Measurement of frequency and amplitude of waveforms.
14. Transistorized astable multivibrator.(Measurement of Pulse width, space width, time period, frequency and duty cycle)
15. Transistorized Mono stable multivibrator.(Measurement of gate width)
16. Transistorized Bistable multivibrator.
17. RC ramp generator using transistor. (Measurement of rise time, fall time and frequency)
18. IC 555 Timer(Measurement of Pulse width, Space width, Time period, frequency and Mark to Space ratio).
19. VCO using IC566(Measurement of frequency with change in control voltage)

Paper-VII: Electronics Practicals

100 Marks

Note: (i) Every student must perform atleast 10 experiments.
(ii) Use flow chart wherever necessary.

1. Write an ALP to Transfer a block of data from one location to another location.
2. Write an ALP for addition of two byte and result 8-bit
3. Write an ALP for addition of two byte and result 16-bit
4. Write an ALP for subtraction of two bytes.
5. Write an ALP for decimal addition of 8 bit byte
6. Write an ALP for 1's complement of 8-bit and 16-bit numbers.
7. Write an ALP to find 2's complement of 8-bit and 16-bit numbers
8. Write an ALP for shifting of 8-bit number
    a. Left by one bit
    b. Left by two bit
9. Write an ALP for masking of
    a. Four LSB s of 8-bit numbers
    b. Four MSB s of 8-bit numbers

10. Write an ALP to find larger of two numbers.
11. Write an ALP to find smaller of two numbers.
12. Write an ALP to find smallest number from series.
13. Write an ALP to find largest number from series.
14. Write an ALP to find sum of series of 8-bit numbers.
15. Write an ALP to find multiplication of two 8-bit numbers.
16. Write an ALP to find division of two 8-bit numbers.
17. Write an ALP to generate square wave using IC 8255. Determine frequency.
18. Interfacing of 7-segment display with 8085 using IC 8255.