GULBARGA UNIVERSITY

SYLLABUS FOR B.Sc. ELECTRONICS (SEMESTER SCHEME)

The syllabus is prepared according to the Regulation for B.Sc. Course (semester scheme). Electronics is one of the three optional subjects of equal importance.

The details of marks for each subject (Theory & Practical) and duration of examination are given on separate sheet.

The Chart showing details of course for subjects and practical is also enclosed. For convenience, optional subject-1 is considered as Electronics.

	No. of Hours	Paper Details
Semester –I	64	1.3 – Fundamentals of Electronics
Semester – II	64	2.3 – Electronic Circuits
Semester – III	64	3.3 – Electronic Circuits and Applications
Semester – IV	64	4.3 – Digital Electronics
Semester – V	60	5.1 – Communication Electronics - I
	60	5.2 – Digital Electronics & Microprocessors
Semester – VI	60	6.1 – Communication Electronics – II
	60	6.2 – Instrumentation, Interfacing & Microcontrollers 8031/51.

Details of Theory Papers and Practicals and Duration of Examination in Each Semester for subjects with Practicals is as shown below:

Semester	Course No.	Paper No.	Title of Paper	Duration of Examination		Marks	
				Theory Hrs	Practical Hrs	Theory	Practical
First	1.1	I	English	03	..	100	..
	1.2	I	Ind. Language/ Addl. English	03	..	100	..
	1.3	**I**	**Optional - 1**	**03**	**03**	**100**	**50**
	1.4	I	Optional - 2	03	03	100	50
	1.5	I	Optional - 3	03	03	100	50
Second	2.1	II	English	03	..	100	..
	2.2	II	Ind. Language/ Addl. English	03	..	100	..
	2.3	**II**	**Optional - 1**	**03**	**03**	**100**	**50**
	2.4	II	Optional - 2	03	03	100	50
	2.5	II	Optional - 3	03	03	100	50
Third	3.1	III	Communication English	03	..	100	..
	3.2	III	Communication Language/ Addl. English	03	..	100	..
	3.3	III	**Optional - 1**	**03**	**03**	**100**	**50**
	3.4	III	Optional - 2	03	03	100	50
	3.5	III	Optional - 3	03	03	100	50
Fourth	4.1	IV	Constitution of India	03	..	100	..
	4.2	IV	Computer Applications/ General studies	03	..	100	..
	4.3	**IV**	**Optional - 1**	**03**	**03**	**100**	**50**
	4.4	IV	Optional - 2	03	03	100	50
	4.5	IV	Optional - 3	03	03	100	50

Semester	Course No.	Paper No.	Title of Paper	Duration of Examination		Marks	
				Theory Hrs	Practical Hrs	Theory	Practical
Fifth	**5.1**	**V**	**Optional - 1**	**03**	**03**	**100**	**50**
	5.2	**V**	**Optional - 1**	**03**	**03**	**100**	**50**
	5.3	V	Optional - 2	03	03	100	50
	5.4	V	Optional - 2	03	03	100	50
	5.5	V	Optional - 3	03	03	100	50
	5.6	V	Optional - 3	03	03	100	50
Sixth	**6.1**	**VI**	**Optional - 1**	**03**	**03**	**100**	**50**
	6.2	**VI**	**Optional - 1**	**03**	**03**	**100**	**50**
	6.3	VI	Optional - 2	03	03	100	50
	6.4	VI	Optional - 2	03	03	100	50
	6.5	VI	Optional - 3	03	03	100	50
	6.6	VI	Optional - 3	03	03	100	50

FIRST SEMESTER

1.3 - FUNDAMENTAL OF ELECTRONICS

UNIT – I: Passive components: **10 Hrs**

Resistors: Specification, tolerance, rating, colour code, power dissipation, type of resistors-fixed and variable.

Capacitors: Specification, colour code, energy stored in a capacitor, type of capacitor-fixed and variable, electrolytic.

Inductors: Specification, energy stored in an inductor, types-air core and iron core. Charging and discharging of capacitors and inductors through a resistor.

Transformer: Working, Classification, power loss in transformers and chokes. Fuses, switches and relays.

UNIT – II: AC Circuits: **12 Hrs**

Representation of ac, sine wave-cycle, time period, frequency, average value, peak value (amplitude), peak-to-peak, rms value phase and phase difference, power factor, phasor diagram, complex numbers, j-operator, reactance and impedance.

RL series and RC series circuits, RLC circuits: series and parallel- impedance curve, selectivity, bandwidth, Q-factor (loaded and unloaded Q), comparison between series RLC and parallel RLC circuits.

Series resonance-condition for resonance, resonant frequency, half power frequencies, BW quality factor (loaded and unloaded Q) comparison and applications.

UNIT – III: Circuit Analysis: **12 Hrs**

Current and voltage sources: Ideal and real voltage and current sources. DC resistive circuits: Voltage divider and current divider theorems, open and short circuits, Kirchoff's law-mesh analysis and node voltage method.

UNIT – IV: Network Theorems: **10 Hrs**

T and Pi networks, inter-conversion, superposition theorems, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem and Millman's theorem.

UNIT – V: Semiconductor Physics: **10 Hrs**

Electronic structure of a atoms, Energy band theory of crystals – Insulators, Semiconductors and Metals – Electrons and holes in an intrinsic semiconductor,

conductivity of a semiconductor, carrier concentration in an intrinsic conductor, donor and acceptor impurities, charge densities in a semiconductor, Fermi level in a semiconductor having impurities.

UNIT – VI: Semiconductor Devices **10 Hrs**

Construction, working, characteristics curves, PN junction Diode, Zener Diode, Tunnel diode Schottky Diode, photo Diode, Varactor Diode, LED.

Textbooks:

1. Introductory circuit analysis, Robert Boylstead–PHI, 5th Edition (Unit-I, II & III).
2. Basic Electronics & Linear Circuit, NN Bhargava, DC Kulshresta & DC Gupta, TMH (Unit-IV and V)
3. Electronic Devices & circuits, Jacob Millman & Halkias, TMH, 1994 (Unit-V).

Reference Books:

1. Electronic Devices & Circuit Theory, Robert Boylsted and Louis Nashelksky-.PHI.
2. Basic Electronics, B. Grob, 8th Edition.
3. Electrical Circuits & Application, B. Grob.
4. Electronic Devices & Circuits, Allen Mottershed.
5. Electronics Text Lab manual, Paul B. Zbar.
6. Fundamentals of Electronics, B. Basavaraj, Revised Edition, 2002.

Semester – I: Practicals

Note: Minimum 12 experiments are to be performed.

1. Study of analog and digital meters, miultimeter, function generator, CRO.
2. Verification of KCL and KVL for DC networks
3. Verification of Thevenin's Theorem.
4. Verification of Superposition Theorem.
5. Verification of Maximum Power Transfer Theorem.
6. Verification of Reciprocity Theorem.
7. T to Pi and pi to T network conversion.
8. Charging and discharging Characterization of RC Circuit.
9. Charging and discharging Characterization of RL Circuit.
10. Series Resonance Circuit – Determination of Resonant Frequency, Bandwiidth and Q- factor.
11. Parallel Resonance circuit – Determination of Resonant Frequency, Bandwidth and Q- factor.

12. Measurement of V_{pp}, V_p, T and F using CRO (for sine and square waves).
13. Study of V-I characteristics of Semiconductor diode.
14. Study of V-I Characteristics of Zener Diode.
15. V-I Characteristics of UJT and determination of V_p and V_v.
16. LED Characteristics.

SECOND SEMESTER

2.3 – ELECTRONIC CIRCUITS

UNIT – I: Bipolar junction Transistor: 10 Hrs

Transistor symbols, NPN/PNP – working – CB, CE and CC Modes, current gain, alpha, beta, gamma relations – input and output characteristics of CB and CE configuration – leakage circuit.

UNIT – II: Unipolar Devices and applications: 10 Hrs

Construction, working, characteristics curves and applications: UJT, FET and MOSFET – Enhancement type and depletion type, FET as a voltage variable resistor, UJT relaxation oscillator, Common source FET amplifiers.

UNIT – III: Power Supplies: 10 Hrs

Block diagram of Regulated Power Supply, Half–wave, Full–wave and bridge rectifiers – rectification efficiency and ripple factors.

Filters: Series inductor filter and shunt capacitor filter, LC filter, Pi-section filter, L-filters performance, comparisons. Voltage regulators – Zener diode as a regulator, series transistor regulator and shunt transistor regulator. IC voltage regulators – 78xx and 79xx series ICs –specifications and data sheet interpretations.

UNIT – IV: Biasing and Equivalent Circuits: 12 Hrs

Transistor biasing: Need for biasing – load line – operating point, thermal runaway-fixed bias with and without emitter resistor – voltage divider bias – design – bias stability – stability factor determination in each case – importance of voltage divider bias. h-parameter – hybrid equivalent model of a transistor in CE mode – ac equivalent circuit of small signal amplifier using hybrid model – expression for current gain – voltage gain – input and output impedances.

UNIT – V: Voltage Amplifiers: 10 Hrs

Classification of amplifiers – RC coupled amplifier, transformer coupled amplifier and direct coupled amplifier, their frequency response. Emitter follower, Darlington pair amplifier.

UNIT – VI: Power Amplifier: 12 Hrs

Class–A single ended power amplifier, class–B push - pull amplifier (transformer coupled), complementary symmetry Class-B push-pull amplifier, harmonic distortion and cross-over distortion. Expressions for the power efficiency for the above amplifiers. Tuned amplifier: single tuned amplifier, its frequency response, bandwidth, Q-factor.

Textbooks:

1. Electronic Devices & Circuit Theory, Robert Boylsted and Louis Nashelksky-.PHI. (Unit-I, II and III).
2. Electronic Devices: David A Bell – Reston publishing Company/ DB Tarapurwalal Pub. (Unit IV and V).

Reference Books:

1. Applied Electronics: R.S. sedha – S. Chand & Co.
2. Electronic Devices & Circuits, Allen Mottershed.
3. Fundamentals of Electronics, B. Basavaraj, Revised Edition, 2002.
4. Basic Electronics & Linear Circuits, NN Bhargava, DC Kulshreshta and DC Gupta- TMH.
5. Electronics: Analog and Digital, IJ Nagarath.
6. Electronic Principles: AP Malvino, TMH, 6^{th} Edition.
7. Electronic Devices, Applications and ICs: Mathur, Kulshreshta & Chadha, Umesh Publications.
8. Hand Book of Electronics: Gupta & Kumar, Pragathi Prakashan, Meerut.
9. Electronics Text lab Manual, Paul B.Zbar.
10. Experiments in Electronics, SV Subramanyam.

Semester – II: Practicals:

Note: Minimum 12 experiments are to be performed.

1. Half-wave rectifiers with and without shunt capacitance filter(ripple factor).
2. Full-wave rectifiers with and without shunt capacitance filter (ripple factor).
3. Bridge rectifier with and without shunt capacitance filter (ripple factor).

4. Zener diode as voltage regulator – load regulation curve and percentage of load regulation.
5. Series transistor voltage regulator – load regulation curve and percentage of load regulation.
6. Construction of regulated power supply using 78xx IC series.
7. Construction of regulated power supply using 79xx IC series.
8. Input and output characteristics of a transistor in CE mode – determination Of h-parameters.
9. Input and output characteristics of a transistor in CC mode – determination of input resistance and current gain.
10. Static and transfer characteristics of FET-determination of pinch-off voltage. Drain resistance, transconductance and amplification factor.
11. UJT relaxation oscillator- determination of η.
12. Single stage R-C coupled amplifier-frequency response, band width.
13. Single tuned amplifier-frequency response, band width and Q-factor.
14. Complementary symmetry class-B Push-Pull Power amplifier.

THIRD SEMESTER
3.3 – ELECTRONIC CIRCUITS

UNIT – I: Wave Shaping Circuits: 10 Hrs

Linear wave shaping – integrator and differentiotor (RC and RL), Non-linear wave-shaping – positive, negative biased clippers and clamplers.

UNIT – II: Feedback in amplifiers and Waveform generators 10 Hrs

Basic concept of feedback in amplifiers, positive and negative feedback in Amplifiers, effect of negative feedback on amplifier characteristics.

Basic Principle of Oscillators: Tank Circuit, Barkhausen criteria – LC Oscillators – Hartley and Colpitt's RC Oscillators – Phase Shift oscillators – Wienbridge and Crystal Oscillators using Transistors – Expression for frequency of oscillations in each case and condition for sustained oscillations.

Types of multivibrators – block diagrams of astable, monostable and bistable multivibrators - monostable and astable multivibrators using transistors.

UNIT – III: Operational Amplifiers 10 Hrs

Differential Amplifier: Emitter coupled differential amplifier and its working.

Operational Amplifiers: Block diagram – equivalent circuits – ideal op-amp characteristics, virtual ground, op-amp parameters – input bias current, input offset

voltage, output offset voltage, input offset current, input and output resistance, CMRR, slew rate, SVRR, thermal drift, frequency compensation. Open Loop Gain in Inverting and Non-inverting mode and differential gain – limitations.

UNIT – IV: Op-Amps and Applications **10 Hrs**

Op-Amp with negative feedback: Feedback – types of feedback – closed loop voltage gain using block diagram – types of negative feedback using block diagram, advantage of negative feedback, expression for closed loop voltage gain of non-inverting, inverting amplifier and differential amplifier. Adder, sign changer, scale changer and difference amplifier-V to I convertor and vice versa – Integrator – Differentiator, Logarithmic and anti-logarithmic amplifiers.

UNIT – V: Waveform Generators **10 Hrs**

Comparator, Schmitt Trigger, Astable, Monostable and Bistable multivibrators, Phase Shift oscillator and Wienbridge oscillator.

Active Filters: Importance of active filters – first order Butterworth low-pass, high-pass, band-pass and band-eleimination filters, all pass filters (expression for cut-off frequency and pass band gain).

UNIT – VI: Timer and IC Voltage Regulators **10 Hrs**

IC timer – 555: Structure and working (block diagram), Astable, Monostable, Bistable Multivibrators, Schimitts Trigger using timer.

IC Regulators: Classification of linear and switching regulators, variable positive and negative voltage regulators (IC LM 317 and LM 337). Switching Regulators SG 3524/ TL-497.

Textbooks:

1. Operational amplifiers and linear integrated circuits: Ramakanth Gayakwad, PHI, 5th Ed. (Unit-III, IV, V and VI).
2. Electronic Devices and Circuit Theory: Robert Boylstead and Louis Nashelsky, PHI, 6th Ed. (Unit-I & II).

Reference Books:

1. Operational Amplifiers and Linear Integrated Circuits by Robert F. Coughlin & Frederick F. Driscoll, PHI.
2. Electronic Principles, AP Malvino, TMH, 5th Edition.
3. Integrated Circuits, KR Botkar, Khanna Publishers.

4. Electronic Des, Applications and Inegrated Circuits, Mathur, Kulshreshta & Chadha, Umesh Publications.

Semester – III Practicals

(Minimum 12 Experiments to be done)

1. Construction of Hartley Oscillator using Transistor (determination of frequency of oscillation)
2. Construction of Colpitt's Oscillator using Transistor (determination of frequency of oscillation)
3. Construction of Phase Shift Oscillator using Transistor (determination of frequency of oscillation)
4. Construction of Wien-Bridge Oscillator using Transistor (determination of frequency of oscillation)
5. Construction of Crystal Oscillator using Transistor (determination of frequency of oscillation)
6. Inverting and non-inverting Op-amp (determination of gain)
7. Frequency Response of inverting Op-amp (determination of bandwidth).
8. Frequency Response of non-inverting op-amp (determination of bandwidth).
9. Op-amp as Integrator.
10. Op-amp as Differentiator.
11. Construction of Wien-Bridge Oscillator using Op-amp.
12. Construction of Phase Shift oscillator using Op-amp.
13. Variable voltage regulator using IC LM317 (Load regulation curve and load regulation).
14. Instrumentation amplifier using IC 725.
15. Construct first order active low pass filter and high pass filter using Op-amp (frequency response curve and cut-off frequency).

FOURTH SEMESTER
4.3 – DIGITAL ELECTRONICS

UNIT – I: Number Systems **10 Hrs**

Decimal, binary, octal, and hexadecimal – their inter conversion. BCD numbers (8421), Grey, Excess 3, ASCII and EBCDIC codes and error detecting codes. Arithmetic operations in binary, hexadecimal, BCD addition and excess 3 additions. Sign magnitude convention, 1's and 2's complements – 2's complement subtraction, signed number, arithmetic addition.

UNIT – II: Logic Gates and Boolean algebra **10 Hrs**

Positive and negative logic, basic logic gates – AND, OR and NOT gates (logic symbols and truth tables, construction of basic gates using diodes and transistors), NAND and NOR gates (logic symbols and truth tables), X-OR and X-NOR gates (logic symbols and truth tables) and applications, NAND and NOR as universal gates, Boolean algebra – laws and theorems, De Morgan's theorems, simplification of logic expressions using Boolean algebra, SOP and POS expressions. Karnaugh maps, I – map techniques to solve 3 variable and 4 variable expressions.

UNIT – III: Combinational Logic Circuits **10 Hrs**

Arithmetic logic circuits – half adder, full adder, 4-bit parallel binary adder, comparators, decoders, encoders, priority encoders.

UNIT – IV: Sequential Logic Circuits **10 Hrs**

Flip-flops – Basic RS latch (NAND and NOR latches), clocked RS flip-flop (NAND), Edge triggering and level triggering, D flip-flop and edge triggered JK flip-flop, T flip-flop, edge triggered M/S JK flip-flop, clear and present inputs, IC 7374 and IC 7476 (logic diagrams).

UNIT – V: Registers and Counters **10 Hrs**

4-bit serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out, parallel-in-parallel-out applications. Asynchronous counters-logic diagram, truth table and timing diagrams of 3-bit ripple counter, 4-bit up-down counter and modified counters-mod-3, mod-5, mod-7 and mod-n counters, Asynchronous counters, 4-bit synchronous counter, decade counter, up-counter, IC 7490. Synchronous up-down counter, design using K-maps, ring counter and applications.

UNIT – VI: Introduction to IC Logic Families **12 Hrs**

Digital IC terminology, TTL logic family, standard TTL series characteristics, TTL open collector outputs, Tristate TTL, ECL IC family, CMOS series and characteristics.

Textbooks:

1. Digital Fundamental, Flyod, CBS Publichers (Unit I).
2. Digital Systems – Principles & Applications, Ronald J Tocci, P-III, 9th Edition, Pearson Educatio (Unit-II, VI).

Reference Books:

1. Modern digital Electronics, RP jain, TMH Publications, 2nd Edition.
2. Digital Principles and Applications: Malvino & Leach – TMH, 3rd Edition.

3. Digital Logic and Computer Design: M Morris Mano – PHI, New Edition.
4. Digital Computer Electronics: Malvino – TMH.
5. Digital Computer Electronics: Malvino – TMH.
6. Digital Computer Fundamentals: Thomas C Bartee – TMH.
7. Experiments in Digital Principles: Malvino & Leach – TMH.

Semester – IV: Practicals

(Minimum 12 Experiments to be done)

1. Construction of basic gates AND, OR using diodes and NOT using transistor.
2. Verification of truth table of basic gates, universal gates, XOR and X-NOR gates using ICs.
3. IC 74 LS00- Realization of AND, OR, NOT, NOR and X-OR gates.
4. IC 74 LS02- Realization of AND, OR, NOT, NOR and X-NOR gates.
5. Verification of DeMorgan's theorems.
6. Construction of Half Adder and Full Adder using IC 74LS86, 74LS02 and IC74LS32.
7. Binary to Grey code and Vice-Versa using 74LS86.
8. BCD to seven segment conversion using IC 74LS47.
9. Construction of JK flip-flop using logic gates and its truth table verification.
10. Conversion of JK flip-flop into D- and T- flip-flop and its truth table verification.
11. Construction of clocked R-S, D and T flip-flop using ICs.
12. Study of 4-bit binary ripple counter using IC 74LS76 (or Equivalent).
13. Frequency division (divide by 5, divide by 10) using IC 74LS390.
14. 4-bit parallel adder using IC 74LS83.
15. Characteristics of TTL Gates.
16. Study of working 3 to 8 decoder using IC 74LS138.
17. Study of working of priority encoder using IC 74LS147.

FIFTH SEMESTER

5.1 – COMMUNICATION ELECTRONICS–I

Unit – I: Electromagnetics: 12Hrs.

Propagation of radio waves, ionosphere – formation and composition, mechanism of radio wave propagation, different modes of radio wave propagation (qualitative analysis). Maxwell's for free space in integral and differential form. Poynting vector

and Poynting theorem. Rectangular waveguides, TE, TM and TEM modes (qualitative analysis).

UNIT – II: Antennas: 08 Hrs

Antenna parameters, dipole antenna, radiation resistance, power radiated by dipole antenna, TV receiver antenna requirements, resonant antenna, Yagi antenna.

UNIT – III: Modulation Techniques: 12 Hrs

Need for modulation, amplitude modulation, expression for AM wave, modulation index, frequency spectrum, power relations. Modulator circuits: Emitter modulator, Base modulator and Collector modulator. Frequency modulation: Expression for FM wave, modulation index. Modulator circuits: Varactor diode and FET (or Transistor) reactance modulator. AM and FM transmitters: Block diagram, comparison of AM and FM. Phase modulation: Expression for PM, comparison of FM and PM.

UNIT – IV: Demodulation: 08 Hrs

AM diode detector: Square law diode detector, linear diode detector, AGC and need for AGC.

FM detector: Slope detector, Balanced slope detector and Foster-Seeley discriminator.

UNIT – V: Radio Receivers: 10 Hrs

Receiver characteristics, AM TRF receiver, super heterodyne receivers for AM and FM, Comparison of AM and FM receiver.

Text Books:

1. Electronic Communication – Sanjeev Gupta (Unit-I & II).
2. Radio Engineering – G.K. Mittal (Unit-II, III, IV & V)

Reference Books:

1. Electronic Communication Systems – George Kennedy, MGH
2. Electronic Communication – Roddy and Coolen.
3. Electronic and Radio Engg. – FE Terman, 4th Edition, TMH
4. Modern electronic Communication – Gary M. Miller and Jeferry S Beasley, PHI.

Semester – I: Practicals

(Minimum Eight Experiments to be performed)

1. RC Differentiator and Integrator (Trace I/O waveforms for sine, square and triangular waves).
2. Clipping circuits – Positive, Negative and biased.
3. Clamping circuits - Positive, Negative and biased.
4. Construction of AMV and Schmitt trigger using IC 555.
5. Construction of MMV and BMV using IC 741.
6. Two stage RC coupled amplifier- frequency response.
7. Amplitude modulator using Transistor.
8. Linear diode AM detector.
9. IF amplifier.
10. Study of Pre-Emphasis and De-Emphasis circuits.
11. Frequency response to Loudspeaker.
12. Double tuned amplifier-frequency response.
13. Study of AGC circuits (in AM detector).
14. Frequency mixer.
15. FET reactance modulator.
16. Single slope detector
17. Ratio detector.
18. Study of colour mixing using electronic filters.

FIFTH SEMESTER

5.2 – DIGITAL ELECTRONICS AND MICROPROCESSOR

UNIT – I: Data Selector and Signal Convertors: 10 Hrs

Multiplexer and Demultiplexer, data converters – D to A converters, Binary weighted resistor network and R-2R ladder network. A to D converters – Dual slope Integrating type, Successive approximation method, Flash converter, resolution and accuracy for above converters.

UNIT – II: Memory Devices: 10 Hrs

Introduction to primary and secondary memories.
RAM – Static and Dynamic, ROM, EPROM, EEPROM, CCD's RAM array diode matrix.

UNIT – III: 8085 Microprocessor: 10 Hrs

8085 based microcomputer system- 8085MPU, Architecture and Pin configuration. Instructions and Timings – Instruction classification, Instruction format, Instruction timing and Operation status, Instruction set, Addressing modes and groups, Instruction cycle.

UNIT – IV: 8085 Programming: 10 Hrs

Data transfer instruction, arithmetic operation, logic operation, branch operation. Writing assembly language program.
Stacks, subroutines and interrupts in 8085.

UNIT – V: 8085 Interfacing: 10 Hrs

Need of interfacing devices, parallel and serial interface, PPI 8255, USART 8251, Key board display interface 8279, DMA controller 8237, PIT 8253, A to D converter and D to A converter.

Text/Reference Books:

1. Modern Digital Electronics – R.P Jain, TMH (Unit-I & II).
2. Digital Principles and Applications – A.P Malvino, TMH (Unit-I & II).
3. Microprocessor: Architecture, Programming and Applications – R A Goankar (Unit III - V).
4. Fundamentals of Microprocessor and Microcontrollers – B. Ram (Unit-I - V).

Semester – II: Practicals

(Minimum Eight Experiments to be performed)

1. Study of multiplexer using IC 74LS150.
2. Study of De-multiplexer using IC 74LS154.
3. Construction of DAC using R-2R ladder network.
4. Transfer of data from various register of 8085.
5. 1's and 2's compliments of 8-bit numbers.
6. Addition and subtraction of two 8-bit numbers.
7. Addition of two 16-bit numbers.
8. Largest number among given series of hexadecimal numbers.
9. Smallest number among given series of hexadecimal numbers.
10. Arrange the given hexadecimal numbers in ascending order.
11. Arrange the given hexadecimal numbers in descending order.
12. Finding square root of a number.
13. Multiplication of two 8-bit numbers.
14. Division of a 16-bit numbers by an 8-bit number
15. Interfacing of 8-bit DAC.
16. Interfacing of 8-bit ADC.
17. Interfacing of 7-segment LED display and display of alpha numeric characters.
18. Relay interfacing.
19. Logical ANDing, ORing and Inversion using 8085.
20. Logical XORing and XNORing using 8085.

SIXTH SEMESTER

6.1 – COMMUNICATION ELECTRONICS-II

UNIT – I: Monochrome Television: 10Hrs.

Elements of TV broadcasting, scanning-progressive scanning and interlaced scanning, Aspect ratio, composite video signal, blanking and synchronous pulses, TV channel (CCIR-B) allotement of frequency.

Camera tubes: Camera tube characteristics, principle, construction and working of vidicon and image orthicon camera tubes.

VSB Transmission, block diagram of monochrome TV transmitter and receiver.

UNIT – II: Colour Television: 06Hrs.

Colour Television: Principle, Compatibility, mixing of colour, colour camera system, luminance and chrominance signal, colour sub carrier, PAL-system, PAL encoder and PAL decoder, colour picture tube and block diagram of colour television receiver (PAL system).

UNIT – III: Satellite and Mobile Communication: 12Hrs.

Introduction, satellite orbit, satellite links, path loss, multiple access method, FDMA, TDMA, CDMA (qualitative anlysis).

Basic telephone, cellular phone operation, PCS systems, Local Area Networks, WAP protocol, Internet (preliminary ideas).

UNIT – IV: Digital Communication: 14Hrs.

Introduction, different modulation techniques-PAM, PWM, PPM, PCM and Delta modulation, Synchronous, Asynchronous transmission, probability of bit error in base band transmission, matched filter, optimal filters, bit timing recovery, eye diagrams, digitak carrier systems – ASK, FSK, PSK, DPSK, QPSK, carrier recovery circuits.

UNIT – V: Optical Fibres Communication System: 06Hrs.

Block diagram of optical fibre communication system, Characteritics of NA, launching angle, Types of optical fibres, rays and modes, fibre materials.

Text Books:

1. Electronic communication – Sanjeev Gupta (Unit- I & II).
2. Radio Engg. – G.K. Mittal (Unit-I & II)
3. Electronic communication – Roddy and Coolen – PHI (Unit-II-IV)
4. Fibre optic communication – G.Kiser, MGH, 3rd Ed. (Unit-V)
5. Principles of communication system, Taub and Schilling, TMH (Unit-II).

Reference Books:

1. Modern digital and analog communication systems – B P Lathi.
2. Basic Television – Bernold Grob.
3. Basic TV transmission and reception – A. K. Mittal.

SIXTH SEMESTER

6.2 – INSTRUMENTATION AND MICROCONTROLLERS

UNIT – I: Instrumentation (Sensors and Applications): 12Hrs

Resistance type temperature sensors, Thermistors, thermocouples, solid state sensors, quartz thermometers, radiation type sensors- optical pyrometers. Displacement and stain transducers: LVDT, strain gauge-types of strain gauges, material for strain gauge. Pressure transducers: elastic transducer, bourdon or helical tubes, piezo electronic pressure transducers.

UNIT – II: Signal Conditioners: 12 Hrs

Filters- Integrator, Differentiators and active filters, low pass, high pass, band pass, band rejection and precision rectifier (Op-amp), peak detectors, sample and hold circuits, phase sensitive detector, instrumentation amplifier, isolation amplifiers, lock-in-amplifier.

UNIT – III: 8051 Microcontroller: 8 Hrs

Microcontroller and Embedded processors, overview of 8051 family, 8051 family, 8051 architecture, registers and memories in 8051, registers banks, flag bits, PSW register, data types, JUMP, LOOP and CALL instructions.

UNIT – IV: 8051 Addressing modes and Instruction set: 8 Hrs

I/O programming of 8051- I/O programming, bit manipulation, addressing modes, arithmetic, logical and single bit instruction and programming.

UNIT – V: 8051 Timer/Counter programming and Interfacing: 8 Hrs

8051 Timer programming, Counter programming, Interfacing of ADC and DAC to 8051.

Text Books:

1. Transcuders and Instrumentation- DVS Murthy, THI, (Unit I & II)
2. 8051 Microcontroller and Embedded systems- M A Mazidi & J G Mazidi (Unit III-V)

Reference Books:

1. The 8051 Microcontroller Architecture, programming and applications- K J Ayala
2. Programming and customizing the 8051 Microcontroller- Myke Predko, THM
3. Measurements systems, applications design- Doeblin, MGH

Practical-1: Minimum Eight experiments to be performed

1. Photo transistor characteristics
2. Precision Full-wave rectifier using Op.Amp.
3. Construction of Instrumentation amplifier
4. Temperature transducer and response curve
5. Study of PAM
6. Study of PWM
7. Study of PPM
8. Study of ASK
9. Study of FSK
10. Study of PSK
11. 1's & 2's compliments of 8-bit numbers using 8051
12. Addition and subtraction of two 8-bit numbers using 8051
13. Addition of two 16-bit numbers using 8051
14. Program for Largest number among given series of hexadecimal numbers using 8051.
15. Program for Smallest number among given series of hexadecimal numbers using 8051.
16. Arrange the given hexadecimal numbers in ascending order using 8051.
17. Arrange the given hexadecimal numbers in descending order using 8051.
18. DAC interfacing to 8051.
19. ADC interfacing to 8051.
20. Seven segment LED interfacing with 8051.
21. Relay interfacing with 8051.

Practical-2: Students have to construct and demonstrate a simple project work.