**MANONMANIAM SUNDARANAR UNIVERSITY**
**TIRUNELVELI**

## UG COURSES – AFFILIATED COLLEGES

## B.Sc. Electronics and Communication
## (Choice Based Credit System)

**(with effect from the academic year 2016-2017 onwards)**

**(45th SCAA meeting held on 09.02.2017)**

| Sem. | Pt. I/II / III/ IV/ V | Sub No. | Subject status | Subject Title | Hrs/ week | Cre-dits | Marks | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Maximum | | | Passing minimum | |
| | | | | | | | Int. | Ext. | Tot. | Ext. | Tot. |
| III | III | 15 | Core – 3 | ELECTRONIC CIRCUITS | 6 | 4 | 25 | 75 | 100 | 30 | 40 |
| | | 16 | Core – 4 | MEASUREMENT AND CIRCUIT THEORY | 6 | 4 | 25 | 75 | 100 | 30 | 40 |
| | | 17 | Major Practical – III | CIRCUITS AND MEASUREMENTS LAB | 6 | 4 | 50 | 50 | 100 | 20 | 40 |
| | | 18 | Allied III (Allied Electronics for other major students) | DIGITAL AND DATA COMMUNICATION | 4 | 2 | 25 | 75 | 100 | 30 | 40 |
| | | 19 | Allied Practical – III (Allied Practical for other major students) | COMMUNICATION LAB | 2 | 2 | 50 | 50 | 100 | 20 | 40 |
| | IV | 20 | Skilled Based subject –I | CELLULAR PHONE SYSTEMS | 4 | 4 | 25 | 75 | 100 | 30 | 40 |
| | IV | 21 | Non-Major Elective - I | (A)ELECTRONIC TROUBLESHOOTING (OR) (B)COMPUTER HARDWARE | 2 | 2 | 25 | 75 | 100 | 30 | 40 |
| | SUB- TOTAL | | | | 30 | 22 | | | | | |

| Sem. | Pt. I/II/ III/ IV/V | Sub No. | Subject status | Subject Title | Hrs/ week | Cre-dits | Marks | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Maximum | | | Passing minimum | |
| | | | | | | | Int. | Ext. | Tot. | Ext. | Tot. |
| IV | III | 22 | Core - 5 | LINEAR INTEGRATED CIRCUITS | 6 | 4 | 25 | 75 | 100 | 30 | 40 |
| | | 23 | Major Practical - IV | LINEAR INTEGRATED CIRCUITS AND ELECTRONIC CIRCUITS LAB | 6 | 4 | 50 | 50 | 100 | 20 | 40 |
| | | 24 | Major Elective-I (Select any one) | (A)COMPUTER NETWORKS (OR) (b)TELE COMMUNICATION SYSTEMS | 6 | 5 | 25 | 75 | 100 | 30 | 40 |
| | | 25 | Allied - IV | ADVANCED COMMUNICATION SYSTEMS | 4 | 4 | 25 | 75 | 100 | 30 | 40 |
| | | 26 | Allied Practical - IV | COMMUNICATIONS LAB | 2 | 2 | 50 | 50 | 100 | 20 | 40 |
| | IV | 27 | Skilled Based subject - II | MAINTENANCE AND TROUBLESHOOTING OF AUDIO AND VIDEO EQUIPMENT | 4 | 4 | 25 | 75 | 100 | 30 | 40 |
| | IV | 28 | Non Major Elective-II | (A) INDUSTRIAL CONTROLS (OR) (B) POWER CONVERTORS | 6 | 2 | 25 | 75 | 100 | 30 | 40 |
| | V | | Extension Activity | NCC,NSS, YRC, YWF | | 1 | | | | | |
| | SUB- TOTAL | | | | 30 | 26 | | | | | |

## MSU/2016-17/UG-Colleges/Part-III (B.Sc.Electronics and Communication) / Semester-III/Ppr.no.15/Core-3

# ELECTRONIC CIRCUITS

**UNIT I**

Rectifiers- half wave rectifier, full wave rectifier, bridge rectifier, Inductor- Capacitor-L type filters-ripple factor-Voltage regulator(series type)-current limit over load production-introduction to IC fixed and variable IC 723,78XX,79XX-voltage regulators-formula value substitution problems.

**UNIT II**

Amplifiers-general principle of operation-classification of amplifiers-classification of distortion (amplitudes, frequency, phase)-RC coupled amplifier-gain-frequency response-input and output impedance -multistage amplifiers-transformer couple amplifiers-frequency response-formula value substitution problems.

**UNIT III**

Introduction-classification power amplifier-class A power amplifier-class A push pull amplifier-class B power amplifier- class B push pull amplifier- class C power amplifier- class C push pull amplifier-power dissipation output power-distortion-formula value substitution problems.

**UNIT IV**

Feed back-basic concepts-characteristics-effect of negative feed back- on gain- stability-distortion-band width- analysis of voltage and current feed back amplifier circuits- formula value substitution problems.

**UNIT V**

Classification of oscillators-use of positive feed back – barkhausen criterion for oscillation-colpitts oscillator-Hartley oscillator-wein bridge oscillator- phase shift oscillator- crystal oscillator-frequency stability of oscillators-multivibrators (mono, astable, bistable)- formula value substitution problems.

**BOOKS FOR REFERENCE:**


1. Electronic devices and circuits-Millman & Halkias.
2. Electronic devices and applications and Integrated circuits-Mathu.
3. Basic Electronics-B.L.Theraja.
4. Electronic devices and circuits- G.K.Mithal,Khanna publishers.
5. Electronic devices and circuits – Allen mottershead.
6. Problems and solutions of electronic devices and circuits-Experience teachers (CBS publication, New Delhi).

# ELECTRONIC MEASUREMENTS AND CIRCUIT THEORY

**UNIT I**

Measurements, errors in measurements- measurement standard, Classification and characteristics of Transducers, AC/DC Bridge measurements and their applications.

**UNIT II**

PMMC – DC ammeter – DC voltmeter - Voltmeter sensitivity - Ohm meter – VOM or Multimeter – Calibration Digital Voltmeters and Multimeters, AC Voltmeter-Vector Voltmeter- CRO-Block Diagram – single beam – dual trace – Sampling Oscilloscope,

**UNIT III**

Ohms Law-power Energy-resistors in series,parallel- Kirchoff's Laws and their applications – Branch and loop currents- mesh and node analysis.

**UNIT IV**

Fundamental ideas of AC circuits - impedance of RL, RC, RLC circuits-Resonance in AC circuits-series and parallel.

**UNIT V**

Network graph of a network- concept of tree- branches and chords dual networks- Network theorems: Superposition, Thevenin, Norton, Maximum Power transfer Theorem

**BOOKS FOR REFERENCE**:

1. C.S.Rangan "Instrumentation Devices and Systems" Tata McGraw Hill, 1998.
2. Copper "Electronic Instrumentation and Measurement Techniques" PHI
3. A.J. Bouwels "Digital Instrumentation", McGraw Hill, 1986
4. C.Barney "Intelligent Instrumentation" Prentice Hall of India, 1985
5. Oliver and Cage "Electronic Measurements and Instrumentation" McGraw HILL,1975
6. Deobelin "Measurements Systems" McGraw HILL, 1990
7. Electronic circuits – Edminister (Schaum outline series – TMH)
8. Circuits and networks, Analysis and synthesis – A.Sudakar & S.P. Shyammohan (TMH).
9. Networks, analysis and synthesis – Umesh sinha.
10. Electronic circuits Theory – Dr.M.Arumugam & Dr.N.Prem Kumaran (Khanna Publishers)

## MSU/2016-17/UG-Colleges/Part-III (B.SC.Electronics and Communication) / Semester-III/Ppr.no.17/Major Practical - III

# CIRCUITS AND MEASUREMENTS LAB

**All experiments have to be carried out compulsorily from A and B**

**A. Circuits Lab**

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of Kirchoff's laws.
4. Verification of Thevenin's theorem
5. Verification of Norton's theorem.
6. Verification of Superposition Theorem.
7. Verification of Reciprocity Theorem.
8. Verification of Maximum Power Transfer Theorem.
9. Transient Response
10. Series resonance.
11. Parallel Resonance

**B. Measurements Lab**

1. Wheatstone bridge
2. Kelvin double bridge
3. Maxwell bridge
4. Hay bridge
5. Schering bridge
6. LVDT
7. Displacement meter
8. Transducer Applications and Measurement
9. Extension of range of PMMC meter
10. Current Measurement using sensors

* Students should be encouraged to do a mini project which should be submitted at the end of the IV semester

## MSU/2016-17/UG-Colleges/Part-III (B.Sc.Electronics and Communication) / Semester-III/ Ppr.no.18/Allied – III

# DIGITAL DATA COMMUNICATION

**UNIT I**

Ray form coding techniques, Information in a communication system - Low pass, band pass, PCM, Quantizing and encoding - Companding – DM – ADM - Comparison of PCM and DM on the basics of speech signals – Telegraphy - Telex - FDM and TDM - coding speech at low bit rays - Typical telephone multiplexing scheme with details of bit, Word and frame- Synchronization.

**UNIT II**

Modulation techniques and codes - Band pass data transmission systems - PSK – FSK-DPSK-QPSK - MSK- Receiver implementation - Signal detection techniques – Definition of codes - need for line shaping signals – RZ - NRZ - Shannon‘s noiseless coding theorem- Shannon coding – Huffman‘s coding.

**UNIT III**

Discrete signals-information rate - Shannon‘s theorem - Channel capacity - Symmetric channels - Deterministic and noiseless channels - Entropy of continuous signals - Rate of transmission – Capacity of band limited channels - Shannon Hartely law - Band width - SNR trade off - Bandwidth efficiency - Shannon‘s limit.

**UNIT IV**

Half duplex – Full duplex - Synchronous and asynchronous communication - Telephone system - Multiplexer circuit, message and packet switching - Concept of protocols - ISO-OSI reference model - Functions of each layers - RS 232C, RS422A, V.24 - SDLC,HDLC procedures.

**UNIT V**

Lan And Internet Working TCP/IP – APQ and protocols used in each layer - LAN topology and standards – IEEE 802.3(CSMA/CD).IEEE 802.4(token bus), Token ring, Purse ALOHA protocols, Conventional channel allocation methods, Radio and satellites networks, ISDN, Local Area Network.

**BOOKS FOR REFERENCE**


1. Digital communication, Simon Haykin, 1st edition, Wiley, India, 2006.
2. Communication Systems, Taub & Schillling, 3rd edition, Tata McGraw Hill, India, 2008.
3. Digital Communications, John Proakis, 5th edition, McGraw-Hill, India, 2007.
4. Introduction to Data communications and networking, M. Schwarts.
5. Computer Networks, Andrew S. Tanenbaum, 3rd edition, Pearson Education in South Asia, India, 2007.

## MSU/2016-17/UG-Colleges/Part-III (B.Sc.Electronics and Communication) / Semester-III/ Ppr.no.19/Allied Practical – III

### COMMUNICATION LABORATORY

**PART- A**

1. Amplitude Modulation(AM) and Demodulation
2. Frequency Modulation and Demodulation
3. Amplitude Shift Keying (ASK) modulation and Demodulation
4. Frequency Shift Keying (FSK)
5. Phase Locked Loop (PLL) and Frequency Multiplier
6. Voltage Controlled Oscillator (VCO)
7. Time Division Multiplexing using (TDM)
8. Binary Phase Shift Keying (BPSK)
9. Pulse Width Modulation (PWM)
10. Directional characteristics of micro phone and loud speakers.
11. Measurement of Connector and Bending Losses in optical fibres.
12. Numerical Aperture Determination for optical Fibers

## MSU/2016-17/UG-Colleges/Part-III (B.sc.Electronics and Communication) / Semester-III/Ppr.no.20/ Skill Based Subject – I

### CELLULAR PHONE SYSTEMS

**UNIT I**

The Cellular System-Background - The cellular concept - interference Vs capacity, cell splitting, sectorisation. The cellular system-mobile location, in call handover and power control in cell planning. TACS standard. The cellular network - Base stations, MSC, services.

**UNIT II**

Introduction to Mobile Devices -Device overview - Input mechanisms - keypad input, pen-based input and voice input. Mobile phone classifications - web enabled phones - Low end smart phones - palm sized PDA - High end smart phones.

**UNIT III**

Cellular Technology Introduction - RF issues - Digital modulation - Power control - Frequency hoping. Signal processing - Digital speech coding - Channel coding and decoding. Software - Radio system software, network management software.

**UNIT IV**

Messaging and Security-Mobile messaging – SMS, EMS,MMS, instant messaging. Message value chain – Wireless carrier, mobile message oriented middlewere (MOM). Security threats – spoofing, sniffing, tampering, theft.

**UNIT V**

Mobile Standards-WPAN standards - IrDA, Bluetooth, 1G, 2G standards, 2.5G applications. 3G devices and applications. Network protocols - TDMA (2G), GSM (2G), CDMA one (2G), PDC 2(G), GPRS (2.5G), CDMA 2000 1x (2.5G), EDGE (3G), CDMA 2000 1xEV (3G), WCMA (G).

**TEXT BOOKS:**

1. Martyn Mallick, Mobile and Wireless Design Essentials, Wiley Publishing, Inc, New Delhi. 2006.
2. R.C.V.Macario, Personal and Mobile Radio Systems, IEE Telecommunications series 25.

# ELECTRONIC TROUBLESHOOTING

**UNIT I**

Corrective maintenance-Troubleshooting-Repairing troubles-Testing or operational check-Troubleshooting aids-corrective maintenance time-intermittent troubles-Precautions while trouble shooting and repair

**UNIT II**

Preventive maintenance-Merits and demerits of preventive maintenance-Preventive maintenance program- Maintenance schedule-Maintenance record-shut down planning-calibration -inspection

**UNIT III**

Classification of printed circuit boards-Manufacturing process-Repair of PCB's

**UNIT IV**

Digital test instruments-Basic digital Measurements-Testing digital circuits-Digital equipment service literature-Digital trouble shooting—use of some test equipments

**UNIT V**

Troubleshooting laboratory and Industrial equipments—Power supplies , oscillators, function generators-Speed controllers-C.R.O

**TEXT BOOK**

Maintenance of Electronic Equipments-K.S Jamwal- Dhanpat Rai &Co

# COMPUTER HARDWARE

**UNIT I**

CPU essentials – processor modes – modern CPU concepts – Architectural performance features – the Intel's CPU

**UNIT II**

Essential memory concepts – memory organizations – memory packages –modules – logical memory organizations – memory considerations – memory types – memory techniques – selecting and installing memory.

**UNIT III**

Active motherboards – sockets and slots – Intel D850GB – Pentium4 mother board – expansion slots – form factor – upgrading a mother board – chipsets –north bridge – south bridge

**UNIT IV**

Power supplies and power management – concepts of switching regulation – potential Power problems – power management. The floppy drive – magnetic storage – magnetic recording principles – data and disk organization – floppy drive – hard drive – data organization and hard drive – sector layout

**UNIT V**

IDE drive standard and features – Hard drive electronics – CDROM drive – construction – CDROM electronics – DVD-ROM – DVD media – DVD drive and decoder.

**TEXT BOOK:**

1. Stephen J.Bigelow, "Trouble Shooting, maintaining and Repairing PCs", Tata

McGraw-Hill, New Delhi, 2001.

**BOOK FOR REFERENCE:**

1. Craig Zacker & John Rourke, "The complete reference: PC hardware", Tata McGraw-Hill, New Delhi, 2001.
2. Mike Meyers, "Introduction to PC Hardware and Trouble shooting", Tata McGraw-Hill, New Delhi, 2003.
3. B.Govindarajulu, "IBM PC and Clones hardware trouble shooting and Maintenance", Tata McGraw-Hill, New Delhi, 2002.

# LINEAR INTEGRATED CIRCUITS

**UNIT I**

Differential amplifiers-dual input-balance output differential amplifier- current mirror- level translator- block diagram representation of typical op amp- interpreting a typical set of data sheets- the ideal opamp- equivalent circuit of an op amp- ideal voltage transfer curve.

**UNIT II**

Input off set voltage – input bias current- input offset current- total output offset voltage- input and output resistance-thermal drift-CMRR-voltage shunt and voltage series feed back amplifiers.

**UNIT III**

Frequency response of initially compensated op amp- circuit stability-slew rate. Filters: low pass filters- high pass filters- band pass filters-band reject filters-all pass filters.

**UNIT IV**

Adder-subtractor-Integrator-differentiator – V to I and I to V converter.

Oscillator: Principles-types-frequency stability phase shift oscillator-wein bridge oscillator- square wave generator –triangular wave generator.

**UNIT V**

Comparator-Schmitt trigger-clipper and clamper-peak detector-zero crossing detectors- IC-555 function block diagram-mono stable operation –astable operation –applications

**BOOKS FOR REFERENCE**

1. Linear Integrated Circuits- D.Roychoudry & Shail Jain (New age publications 1999).
2. Operational amplifiers and linear integrated circuits-F.Couglin & Drison (4th edition prentice hall of India, 1992).
3. Operational amplifiers and linear integrated circuits- Denton J.Dailey, McGraw Hill 1989.
4. Operational amplifiers and linear integrated circuits-Ramakant A.Gayakwad 3rd edition PHI.
5. Second Edn. Operational amplifiers and Linear Ics-David A. Bell.

## MSU/2016-17/UG-Colleges/Part-III (B.SC.ELECTRONICS AND COMMUNICATION) / Semester-IV/Ppr.no.23/ Major Practical – IV

# LINEAR INTEGRATED CIRCUITS AND ELECTRONIC CIRCUITS LAB

**All experiments have to be carried out compulsorily from A and B**

**A. Linear Integrated Circuits Lab**

1. Inverting and Non Inverting Amplifier.
2. Integrator and Differentiator.
3. Instrumentation Amplifier.
4. High pass,Low pass and Band pass filters.
5. Astable and Monostable multivibrator using OP-AMP.
6. Phase shift and Wien Bridge oscillator using OP-AMP.
7. Digital to Analog Converter, Analog to Digital Converter.
8. Astable Multivibrator and Monostable Multivibrator using IC555.
9. Schmitt Trigger and Comparator using OP-AMP.
10. Design of light switch using LDR and Relay.

**B. Electronic Circuits Lab**

1. Half wave rectifier and Full wave rectifier
2. Construction of power supply using C filter and zener diode as regulator.
3. Characteristics of Class A Power Amplifier
4. Characteristics of Class B Power Amplifier
5. Design a Single Stage CE amplifier.
6. Design of Two stage RC coupled Amplifier
7. Clipping and Clamping circuits
8. Hartley Oscillator
9. Colpitt's Oscillator.
10. Astable Multivibrator using BJT.

## MSU/2016-17/UG-Colleges/Part-III (B.SC.ELECTRONICS AND COMMUNICATION) / Semester-IV/Ppr.no.24 (A)/ Major Elective – I (A)

# COMPUTER NETWORKS

**UNIT I**

Data Communication Concepts: Transmission media – Data encoding – Interface and Modems – Multiplexing – Error detection and correction – Digital subscriber line – Circuit switching – Packet switching – Message switching.

**UNIT II**

Wide Area Networks: ISO – OSI layered architecture – Function of the layers – Data link protocols – HDLC, LAPB, LAPD, Inter networking devices – Repeaters, Bridges, Routers, Routing algorithms – Distance vector routing, link state routing, X.25protocol,congestioncontrol.

**UNIT III**

Frame relay and ATM networks: Frame relay operation – layers and traffic control; ATM networks – Architecture switching, layers service classes.

**UNIT IV**

Local Area Network: LAN topology – Ethernet – Token bus – Token ring – FDDI – Wireless LAN, ATM LAN – IEEE 802 Medium access control layer standard –Random access protocols – ALOHA – Slotted ALOHA.

**UNIT V**

OSI Layers: Transport layer issues – Session layer – Synchronization – Presentation layer – Encryption, decryption, Application layer – Message handling system, file transfer, virtual terminal – E-mail.

**TEXT BOOK**

1. William Stallings, “Data and Computer Communication”, sixth edition, Pearson education Asia, 2000.

**REFERENCES**

1. Behrouz A, Forouzan, “Data Communication and Networking”, second edition, Tata McGraw-Hill, 2000.
2. Fred Halsall, “Data Communication, Computer networks and Open Systems”, Fourth edition, Addison Wesley, 1995.
3. Andrew S.Tanenbaum, “Computer networks”, Third edition, PHI, 1996,

# TELECOMMUNICATION SYSTEMS

**UNIT I**

Evolution of Tele-Communication- Basic Switching System, Simple Tele-phone Communication, Telephone Transmitter, Telephone receiver, Telephone's bell & dialer pulsing mechanism, subscribers telephone sets, Dialing types, signaling tones., Brief Introduction to Electromagnetic Exchanges.

**UNIT II**

Electronic Switching-Space Division Switching Stored Programme Control – Centralized SPC, Distributed SPC, Software Architecture, Application Software – Enhanced Services, Multi Stage Switching Networks**.**

**UNIT III**

Time Division Switching - Time Division space switching, Time Division Time Switching, Time multiplexed space switching, Time multiplexed Time Switching, Combination Switching

**UNIT IV**

Traffic Engineering, Grade of Service and Blocking Probability - Telephone Networks, Subscriber Loops, Switching Hierarchy and Routing, Signaling Techniques, In Channel, Common Channel. Transmission media.

**UNIT V**

Fax system: Basic facsimile system, facsimile applications working of FAX machines,recording media,FAX reproduction technique. Mobile radiocommunication : Introduction, cellular structures & planning, Frequency allocation, propagation Problems, Base station antennas, Mobile unit antenna Type of mobile systems, Handoffs, Analog cellular Radio Digital Cellular radio, Digital Narrow band TDMA, CDMA technology.

**REFERENCES**

1.Digital Telemetry by John C Bellamy.

2.Telecommunication Switching System and Network by Tyagrajan

3.Telecommunication system Engg. by Roger L.Freeman.

4.Wireless Mobile Communication by Rappaport

# ADVANCED COMMUNICATION SYSTEM

**UNIT I**

Optical fiber Transmission media Optical communication – Advantages of optical fibers– Block diagram of an optical fiber communication system. Optical fiber construction, Light propagation – Refraction, Refractive index, Snell's law – optical fiber configurations –Coupling fibers –Fiber splicing- Optical fiber connections - Coupling losses ; Optical sources – LED's, ILD, Light Detectors -PIN diodes.

**UNIT II**

Telephone instrument and signals Introduction – Carbon Granule transmitter, Receiving transducer, Simple local battery telephone circuit; – Functions of Telephone set, Block diagram of Telephone set, Basic telephone call procedures, Call progress tones and signals- Dial tone, DTMF tone, Dial tone, Dial pulse , Station busy, Equipment busy, Ringing, Ring-back, Receiver on/off Hook; Cordless telephones, Caller ID ,Electronic Telephones

**UNIT III**

Public Telephone Network and Switching Instruments, Local Loops, Trunk circuits and Exchanges, Local central office telephone Exchanges, Operator assisted local exchanges, Automated central office switches and exchanges; Matrix Switching, Step by step switching.

**UNIT IV**

Cellular telephone concept Cellular telephone – Fundamental concepts of cellular telephones; Frequency reuse, Interference – Co-channel, Adjacent channel, Cell splitting, Sectoring, Segmentation and Duplication, Cellular system topology, Roaming ,Handoff, Cellular Telephone network components- Electronic switching center, Cell-Site controller, Radio Transceiver, System interconnects, Mobile and Portable Telephone units, Communications Protocols.

**UNIT V**

Satellite Communications Keplers laws , Satellite orbital pattern, Geosynchronous Satellites, Satellite classifications, Spacing and Frequency allocation, Satellite Antenna Radiation patterns, Footprints, Satellite system link models – Uplink, Transponder, Downlink,Cross-links.

**REFERENCES**

1.Advanced Electronic Communication Systems-Wayne Tomasi , PHI 6th edition.
2.Telecommunication Systems –P.H Smale , Wheeler Publication 2nd edition.
3.Optical Fiber Communications-Gerd Kaiser, McGraw-hill 2nd edition.
4.Satellite Communications- Roddy,McGraw-hill 4th edition.

## COMMUNICATION LAB

**PART- A** (Carried out in III semester)

1. Amplitude Modulation(AM) and Demodulation
2. Frequency Modulation and Demodulation
3. Amplitude Shift Keying (ASK) modulation and Demodulation
4. Frequency Shift Keying (FSK)
5. Phase Locked Loop (PLL) and Frequency Multiplier
6. Voltage Controlled Oscillator (VCO)
7. Time Division Multiplexing using (TDM)
8. Binary Phase Shift Keying (BPSK)
9. Pulse Width Modulation (PWM)
10. Directional characteristics of micro phone and loud speakers.
11. Measurement of Connector and Bending Losses in optical fibres.
12. Numerical Aperture Determination for Optical Fibers

**PART-B** (To be carried out in IV semester)

1. Voltage to frequency converter.
2. Study of AGC (Automatic Gain Control).
3. Study of mixer circuit.
4. Study of IF amplifier.
5. Analog signal sampling and reconstruction
6. Voltage to frequency converter
7. PSK, DPSK and QPSK Modulation and Demodulation
8. PCM modulation and demodulation
9. Delta / Adaptive Delta Modulation and Demodulation
10. PPM / PAM modulation and demodulation
11. Low high power splitter using MATLAB.
12. Band pass and band stop filter using MATLAB.

# MAINTENANCE AND TROUBLE SHOOTING OF AUDIO AND VIDEO EQUIPMENTS

**UNIT I**

Recording and reproduction principles - Optical recording - Different types - Methods of recording and reproduction - Optical recording on compact disc - play back process - Advantage of compact disc - Trouble shooting in compact disc.

**UNIT II**

Stereophony - Stereophonic recording on disc and reproduction - Hi-Fi Stereo reproducing system - Block diagram of Public Addressing system - Requirement of Public Addressing system - Typical PA installation planning for a public meeting - PA system for an auditorium troubleshooting in PA system.

**UNIT III**

Monochrome, PAL colour TV transmitters Faults in TV transmitter - Testing of TV transmissions monochrome TV receiver - Fault in monochrome TV receiver - PAL colour TV receiver - Faults in colour TV receiver - Testing of TV receiver.

**UNIT IV**

Video disc format - Video recording on disk - Very High density disk - High definition TV system - Block diagram of MAC encoder - MAC receiver - Advantages.

**UNIT V**

Digital TV system - Cable TV concepts set top box - Dish TV and connections - Closed circuit television - Introduction to FLAT LCD and Plasma television systems.

**TEXTBOOKS**

1. Electronic Instruments and systems, Principles, Maintenance and Troubleshooting - R.G. Gupta Tata Mc Graw Hill Publishing Co.Ltd.
2. Colour Television Theory and Practice - S.P. Bali, Tata Mc Graw Hill Publishing Co.Ltd.

**REFERENCE BOOKS**

1. Audio and Video systems - R.G. Gupta Tata Mc Graw Hill Publishing Co.Ltd.
2. Monochrome and Colour Television - R. Gulati. New Age Interbational (P) Ltd. New Delhi.

# INDUSTRIAL CONTROLS

**UNIT I**

Starting and speed control of DC Motors-Starting and speed control of AC motors-Automatic regulation system

**UNIT II**

Elements of automatic control system-Rotary amplifiers-Magnetic amplifiers-Thyristor control of DC and AC motor Inverters-Cycloconvertors

**UNIT III**

Phase control of DC shunt motor-Reversible speed control of DC motor using dual converter-Chopper control of DC series motor-Slip control-Frequency control- constant speed DC drive

**UNIT IV**

Pilot devices and accessories-push button controllers& master switches-rotary selector switches-rotary control switches-over travel and limit switches-Float switches-Pressure switches and regulators-Thermostats or temperature switches-Speed governors

**UNIT V**

Plugging switches-contactors-Electromagnetic relays-Protective relays-Voltage relay-Electromagnetic time relay-control and automation relays-Polarized electromagnetic relay-Construction and operation of electromagnetic relay

## TEXTBOOK

Utilization of Electric Power and Electric Traction-G.C Garg- Khanna Publishers

# POWER CONVERTORS

**UNIT I**

DC – AC PWM inverters: Introduction – Principle of operation – performance parameters – Single phase bridge inverters

**UNIT II**

Three phase inverters – Voltage control of single phase inverters – Voltage control of three phase inverters – Current source inverters.

**UNIT III**

Resonant pulse Inverters: Introduction – Series resonant inverters – Parallel resonant inverters – Zero current Switching resonant converter

**UNIT IV**

Zero voltage switching resonant converter – Two quadrant ZVS resonant converter – resonant DC link inverter

**UNIT V**

Principle of phase controlled converter operation – Single phase full converter – Single phase dual converter

**TEXT BOOK**

Power electronics – Circuits, devices & Applications – Rashid M.H.