ACHARYA NAGARJUNA UNIVERSITY
B.Sc. Electronics CBCS SYLLABUS
B. Sc ELECTRONICS SYLLABUS (2017-18)

VI SEMESTER

PAPER-VII MICRO CONTROLLER AND INTERFACING
Cluster-1
PAPER- VIII (A1) EMBEDDED SYSTEMS DESIGN
PAPER- IX (A2) ELECTRONIC INSTRUMENTATION
PAPER- X (A3) POWER ELECTRONICS

Cluster-2
PAPER-B PC MAINTAINANCE AND TROUBLE SHOOTING
PAPER- VIII (B1) COMPUTER NETWORKS
PAPER- IX (B2) CONSUMER ELECTRONICS
PAPER- X (B3) OPTICAL FIBER COMMUNICATION AND IT’S APPLICATION

LABS:

LAB-7: MICROCONTROLLER LAB
LAB-8: ELECTRONIC INSTRUMENTATION LAB
LAB-9: POWER ELECTRONICS LAB
LAB-10- PROJECT WORK.
ACHARYA NAGARJUNA UNIVERSITY
B.Sc. Electronics CBCS Syllabus

3RD YEAR

VI SEMESTER
PAPER-VII  MICRO CONTROLLERS AND INTERFACING

| Sub: ELECTRONICS | Year: 2017–18 | Group: B.Sc | Credits: 3 |

**TITLE: MICRO CONTROLLERS AND INTERFACING**

**OBJECTIVES:**
- To understand the concepts of microcontroller based system.
- To enable design and programming of microcontroller based system.
- To know about the interfacing Circuits.

**UNIT-I:** (10Hrs)
Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4-bit to 32 bit, Development tools for micro controllers, Assembler-Compiler-Simulator/Debugger.

**UNIT -II:** (10Hrs)
Microcontroller Architecture: Overview and block diagram of 8051, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Interrupts and timers brief only.

**UNIT-III:** (10Hrs)
Addressing modes, instruction set of 8051: Addressing modes , instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions. Time delay generation,

**UNIT-IV:** (15Hrs)
Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order.

**UNIT-V:** (15Hrs)
Interfacing and Application of Microcontroller:
Interfacing of PPI 8255– DAC (0804), interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor ( Uni-Polar), Interfacing of a 4*3 matrix keypad.
**TEXT BOOKS:**
1. The 8051 microcontroller and embedded systems using assembly and c-kennet j.Ayalam, Dhananjay V.gadre, cengage publishers

**REFERENCE BOOKS:**
3. Microcontroller theory and application-Ajay V.Deshmukh

**OUTCOMES:**
- The student can gain good knowledge on microcontrollers and implement in practical applications
- learn Interfacing of Microcontroller
- get familiar with real time operating system
ELECTRONICS LAB-VII
MICROCONTROLLER LAB

LAB LIST:
1. Addition and Subtraction of Two 8-Bit Numbers.
2. Multiplication and Division of Two 8-Bit Numbers.
4. BCD Operation and Reverse and X-Or of Given Numbers.
5. Addition of Two 8-Bit Numbers (Keil Software).
6. Addition of Two 16-Bit Numbers (Keil Software)
7. Subtraction of Two 8-Bit Numbers (Keil Software).
8. Subtraction of Two 16-Bit Numbers (Keil Software).
9. Multiplication of Two 8-Bit Numbers (Keil Software).
11. Program for Swapping and Compliment of 8-Bit Numbers (Keil Software).
12. Program To Find The Largest Number In Given Array (Keil Software).
13. Program To Find The Smallest Number In Given Array (Keil Software).
15. Interfacing Buzzer to 8051 Microcontroller (Keil Software).
16. Interfacing Relay to 8051 Microcontroller (Keil Software).
17. Interfacing Seven Segments to 8051 Microcontroller (Keil Software)
Title: Microcontroller and interfacing

MODEL PAPER

SECTION-A

Answer any FIVE of the following: 5x5=25M

1. Write about evolution of microcontrollers.
2. List and explain some 8051 16-bit registers.
3. Explain CALL instruction and stack.
4. Write an ALP program for two 8-bit numbers.
5. Explain the interfacing of 4*3 matrix keypad.
6. Write short notes on PSW register.
7. Explain about stack pointer.
8. Draw the pin diagram for DAC.

SECTION-B

Answer the following: 5x10=50M

1. a) Explain the difference between microprocessor and microcontroller.
    (or)
   b) Explain development tools used for microcontroller.
2. a) Explain the architecture of 8051 and explain each pin in detail.
    (or)
   b) Draw the pin diagram of 8051 and explain each pin in detail.
3. a) Explain about different types of Addressing modes
    (or)
   b) Explain about (i) single bit instruction (ii)loop instruction(iii)Air thematic instruction with one example each.
4. a) Write a ALP program on largest number in an array.
    (or)
   b) Write an ALP (i) 8-bit addition (ii) multiplication of 8-bit.
5. a) Briefly explain the architecture of 8255(PPI).
    (or)
   b) Explain about interfacing of stepper motor to 8051 microcontroller.
TITLE: Embedded Systems Design

OBJECTIVES:

- design embedded computer system hardware
- design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems
- use and describe the implementation of a real-time operating system on an embedded computer system
- formulate an embedded computer system design problem including multiple constraints, create a design that satisfies the constraints, implement the design in hardware and software, and measure performance against the design constraints
- create computer software and hardware implementations that operate according to well-known standards
- organize and write design documents and project reports
- organize and make technical presentations that describe a design.

UNIT 1: (10Hrs)

Introduction to Embedded Systems:
Embedded systems overview, Processor Technology, IC Technology, and Design Technology.

UNIT 2: (15Hrs)
Custom Single Purpose Processor – Hardware Development:
Introduction, Combinational logic, Sequential logic, Custom Single Purpose Processor Design, RT-Level Custom Single-Purpose Processor.
UNIT 3: (15Hrs)
General Purpose Processor – Software Development:
   Introduction, Basic Architecture, Operation, Programmer’s View, ASIPs, and
   Development Environment;, Linker / Locators for Embedded Software, Getting Embedded
   Software into the target system..
UNIT 4: (10Hrs)
RTWA for Embedded Systems:
   Introduction, Timers, Counters and Watchdog Timers, UART, Pulse Width
   Modulators, LCD Controllers, Keypad Controllers, Stepper Motor Controllers.
UNIT 5: (10Hrs)
Advanced Communication Principles:
   Parallel Communication, Serial Communication, Wireless Communication, Serial
   Protocols: I²C, CAN, and USB. Parallel Protocols: PCI BUS and ARM BUS.

TEXT BOOKS:
1. Embedded System Design – A Unified Hardware / Software Introduction By Frank
   Vahid / Tony Givargis – WILEY EDITION.
   – Tata McGraw-Hill Education.

REFERENCES:
1. An Embedded Software Premier - David E- Siman, PEARSON Education
2. Embedded / real - time systems - DR. K.V.K.K. Prasad, dreamtech
3. The art of programming Embedded systems, Jack G. Ganssle, academic press
4. Intelligent Embedded systems, Louis L. Odette, Adison Wesly, 1991

OUTCOMES:
- The student can gain good knowledge on Embedded Systems and implement in
  practical applications.
- An ability effectively as a member or leader on a technical team
- A commitment to quality, timeliness and continuous improvement

PROJECT WORK-VIII

STUDENTS HAS TO DO A GROUP PROJECT WORK DURING THIRD YEAR
Title: Embedded systems Design

MODEL PAPER

SECTION-A

Answer any FIVE of the following: 5x5=25M
1. Write about embedded system.
2. Explain about Combinational logic.
3. Discuss about linker for embedded software.
4. Write about watchdog timers.
5. Write a short note on Bluetooth.
6. Write short notes on ARM bus.
7. Explain about IC technology.
8. Draw the pin diagram for Pulse width modulators.

SECTION-B

Answer the following: 5x10=50M
1. a) List various application areas of embedded systems and give examples for each application area?
   (or)
   b) Explain about different technologies used in embedded systems.
2. a) Explain the design of custom single processor.
   (or)
   b) Discuss about RT-level custom single processor.
3. a) Explain about basic architecture
   (or)
   b) Describe the function of linker/locator for embedded software.
4. a) Explain about LCD controller
   (or)
   b) Discuss briefly about Stepper motor controllers.
5. a) Briefly explain about serial communication.
   (or)
   b) Explain the following terms in brief (i) I^2C (ii) CAN.
ACHARYA NAGARJUNA UNIVERSITY

B.Sc. Electronics CBCS SYLLABUS

3rd YEAR

VI SEMESTER

PAPER- IX (A2) ELECTRONIC INSTRUMENTATION

Sub: ELECTRONICS Year:2017-18 Group: B.Sc Credits -3

TITLE: ELECTRONIC INSTRUMENTATION

OBJECTIVES:
The student will be introduced to
- To introduce students to monitor, analyze and control any physical system
- To understand students how different types of meters work and their construction
- To Study of absolute is merely confirmed within laboratories
- To Study integrating instruments like ammeter, voltmeter
- To Measurement of impedance using bridges
- To Study of PLL ,ph-meter, PLC

UNIT-I (10hrs)
Measurements:
Basic block diagram of measurement system, Accuracy and precision, resolution, sensitivity, linearity, Errors, systematic and random errors..

UNIT -II (10hrs)
Basic Measurement Instruments:
DC measurement-ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating). Digital multimeter-block diagram

Measurement of Impedance:
A.C. bridges, Measurement of Self Inductance (Anderson's bridge), Measurement of Capacitance (De - Sauty bridge), Measurement of frequency (Wien's bridge).

UNIT-III (15hrs)
Lock-in-amplifier:
Basic Principles of phase locked loop (PLL), Phase detector (XOR& edge triggered), Voltage Controlled Oscillator (Basics, varactor), lock and capture.

Signal Generators: Function generator, Pulse Generator, (Qualitative only).

UNIT-IV (15hrs)
Analytical instruments
Spectrophotometer, working with block diagram, features of spectrophotometer, PH meter - principle working with block diagram, features of PH meter.
TEMPERATURE TRANSDUCERS
Types of transducers, Thermometer, Thermo couple and their characteristics.

UNIT-V : (10hrs)
Direct digital control (DDC), Distributed control system (DCS),
PLC’S: Block diagram, hardware, PLC operation, Applications of PLC’S.

TEXT BOOKS
1. Introduction to instrumentation and control By A.K.Ghosh
3. Industrial instrumentation –Eckman.P.
4. Instrument measurement analysis By Nakra and chaudhry.

Reference Books:

OUTCOMES:
- Design a system, component or process to meet desired needs in electrical engineering.
- Ability to balance Bridges to find unknown values.
- Ability to measure frequency, phase with Oscilloscope
- Ability to use Digital voltmeters
- Ability to measure strain, displacement, Velocity, Angular Velocity, temperature, Pressure, Vacuum, and Flow
LAB LIST:

1. Design of multi range ammeter and voltmeter using galvanometer.
4. Measure of low resistance by Kelvin’s double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge.)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor.
Title: ELECTRONIC INSTRUMENTATION

MODEL PAPER

SECTION-A

Answer any FIVE of the following: 5x5=25M

1. Define the terms (i) Accuracy (ii) Precision
2. What is Digital multimeter?
3. Write a short note on lock in amplifier?
4. Explain about thermo couple and characteristics.
5. Write short notes on Temperature Transducer.
6. Mention some applications of PLC.
7. Define the terms (i) Resolution (ii) Sensitivity.
8. Explain about ohm meter.

SECTION-B

Answer the following: 5x10=50M

1. a) Explain briefly about the block diagram of measurement system.
    (or)
    b) Define the following terms in brief:
       (a) Systematic errors.
       (b) Random errors.

2. a) Explain about Digital voltmeter systems in brief.
    (or)
    b) Discuss briefly about measurement of frequency (Wien bridge).
3. a) Define principle and working characteristics of PLL.
    (or)
    b) Explain briefly about function generator.
4. a) Draw the block diagram of Spectrophotometer and explain.
    (or)
    b) Define principle and working characteristics of P_H meter.
5. a) Discuss briefly about Direct digital control.
    (or)
    b) Explain about the block diagram of PLC and it’s operation.
TITLE: POWER ELECTRONICS

Objectives:
• To study the characteristics of various power semiconductor devices.
• To understand the operation of power inverters.
• To study the operation of rectifiers with different loads.
• To understand the operation of different types of choppers.
• To understand the operation and controlling of motors.

Unit- 1  (12 Lectures)
Power Devices:
   Need for semiconductor power devices, Power diodes, Enhancement of reverse blocking capacity, Introduction to family of thyristors.
Silicon Controlled Rectifier (SCR):
   Structure, I-V characteristics, Turn-On and Turn-Off characteristics, ratings, Factors affecting the characteristics ratings of SCR.

Unit- 2  (14 Lectures)
Diac and Triac:
   Basic structure, working and V-I characteristic of, application of a Diac as a triggering device for a Triac.
Insulated Gate Bipolar Transistors (IGBT):
   Basic structure, I-V Characteristics, switching characteristics.
Application of SCR:
   SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifier switch inductive & non-inductive loads.
Unit- 3  (10 Lectures)
Choppers:
Basic chopper circuit, types of choppers (Type A-D), step-down chopper, step-up chopper, operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit
Unit-4  (10 Lectures)
Power Inverters:
Need for commutating circuits and their various types, d.c. link inverters, Parallel capacitor commutated invertors with and without reactive feedback and its analysis.
Unit- 5  (14Lectures)
Electromechanical Machines:
DC Motors, Basic understanding of field and armature, Principle of operation, EMF equation, Back EMF, Factors controlling motor speed, Thyristor based speed control of DC motors, AC motor (Induction Motor only).

Outcomes:
Student should be able to
• Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR’s.
• Design firing circuits for SCR.
• Explain the operation of rectifiers with different loads.
• Analyze the operation of different types choppers.

Suggested Books:
2. Power Electronics, P.C.Sen, TMH.
4. Power Electronics, M.D.Singh&K.B. Khanchandani, TMH.
7. Power Electronics, P.C.Sen, TMH.
8. Power Electronics, M.S.Jamil Asghar, PHI.
ELECTRONICS LAB-X
Power Electronics Lab

LAB LIST:

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifier switch R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. VI Characteristic of MOSFET and IGBT (Both)
11. Study of chopper circuits
ACHARYA NAGARJUNA UNIVERSITY
B.Sc. CBCS ELECTRONICS SYLLABUS
3rd YEAR
VI SEMESTER

Cluster-2
PAPER-B PC MAINTAINANCE AND TROUBLE SHOOTING

<table>
<thead>
<tr>
<th>ELECTRONICS</th>
<th>Year 2017-18</th>
<th>B.Sc (MECs)</th>
<th>Credits - 3</th>
</tr>
</thead>
</table>

TITLE: PC MAINTENANCE AND TROUBLE SHOOTING

UNIT – I :12Hrs
INTRODUCTION TO COMPUTERS:
Block diagram & types of computers. Mother Board Characteristics, choosing a Motherboard, Installing a Mother board, Upgrading system BIOS. Bus Slots – ISA, MCA, EISA, PCI, USB and firmware (IEEE 1394). Features and comparison of 80286, 80386 and 80486.

UNIT – II :12Hrs
BASIC TROUBLE SHOOTING: Introduction about proper tools in system maintenance, various test equipment for PC servicing, Reasons for failure of resistor, Reasons for failure of capacitor, Reasons for failure of other components, Safety precautions during trouble shooting.

Keyboard: Types of keyboards block diagram of keyboard, keyboard connectors. reasons for failure of keyboard.
Mouse: Working and components of mouse and different connectors.

UNIT – III :12Hrs
STORAGE DEVICES: Introduction about disk drives, Characteristics of different disk drives
FDD:- Different types, working and components of drives.
HDD:-Different types, working and components of HDD drives partitioning & Formatting HDD
CDROM:- Different types working and components of CDROM drives.
UNIT –IV :12Hrs
SMPS: linear, AT, ATX,
Block of SMPS and description of each block.
INTRODUCTION to UPS & SPS:
Reasons for power supply failure, Impact of power supply failure on PC

UNIT – V :12Hrs
PRINTERS:- Different types of printers, dot matrix, INKJET & LASER PRINTER – components and working.
PREVENTIVE MAINTANCE – Effect of heat and noise, Effect of corrosion on PC, Effect of power fluctuations,

TEXT BOOKS:
1. UPGRADING AND REPAIRING PC – SCOTT MULLER.
2. IBM PC and Clones: Hardware, Troubleshooting and Maintenance - GOVINDARAJALU. B

REFERNCE BOOKS:
1. I.T. HARDWARE - NATSHELL.
2. PRINTER MANUALS.
ELECTRONICS LAB

PC MAINTENANCE AND TROUBLE SHOOTING LAB

LAB LIST:

1. Identification of different peripherals and components in a PC.
2. Identification of different types of motherboards.
3. Identification of different expansion slots and add-on cards.
4. Assembling a PC
5. Study of CMOS ROM BIOS setup utilities.
6. Change of CMOS password and boot sequence
7. Connecting hard drives, floppy drives and DVD writer
8. Creating partitions and formatting a hard drive.
9. Installation of windows 2000 Professional and windows XP
10. Installation of application software’s and antivirus software
11. Installation of windows server 2003
12. Installation and configuring display sound and LAN cards.
ACHARYA NAGARJUNA UNIVERSITY  
B.Sc. Electronics CBCS SYLLABUS  

3rd YEAR  
VI SEMESTER  
Cluster-2  
PAPER- VIII (B1)  
COMPUTER NETWORKS

<table>
<thead>
<tr>
<th>ELECTRONICS</th>
<th>Year</th>
<th>B.Sc (MECs)</th>
<th>Credits - 3</th>
</tr>
</thead>
</table>

TITLE: COMPUTER NETWORK

UNIT-I :12Hrs
INTRODUCTION to OSI,TCP/IP and other Network models,Examples of Networks,Novel Networks,Arpanet,Internet,Networktopologies,WAN,LAN,MAN. PHYSICAL LAYER :Transmitted media copper,Twistedparewireless,switching and Encoding asynchronuscommunications,Narrowband,Broadband,ISDN& ATM.

UNIT-II :12Hrs  
DATA LINK LAYER: Design issues,framing,error detection & correction,CRC,elementary protocol-Stop and wait,Slidingwindow,slip,data link layer in HDLC,Internet,ATM

UNIT-III :12Hrs  
MEDIUM ACCESS SUB LAYER: ALOHA,MAC,Address,Carrier sense multiple access,IEEE 802.X standard Ethernet,WirelessLAN,Bridges.

UNIT-IV :12Hrs  
NETWORK LAYER: Virtual circuits and data gram sub nets-routing algorithm,shortest path routing,fooding,Hierarchicalrouting,broadcast,multicast,distance vector routing

UNIT-V :12Hrs  
TRANSPORT LAYER : Transport services,Connection management ,TCP & UDP protocols,ATM AAL layers protocol  
APPLICATION LAYER- Network security,domain name system,SNMP,Electronicmail,The world web,multimedia

TEXT BOOKS:
ELECTRONICS LAB
COMPUTER NETWORK LAB

1. Study of different types of network cables and practically implement the cross wired cable and straight through cable using clamping tool.

2. Study of network Devices in detail.

3. Study of network IP

4. Connect the computers in local area network

5. Study of basic network command and network configuration command

6. Configure a network topology using packet tracer software

7. Configure a network using link state vector routing protocol
B.Sc. Electronics CBCS syllabus

3rd YEAR

VI SEMESTER

Cluster-2
PAPER- IX (B2) CONSUMER ELECTRONICS

<table>
<thead>
<tr>
<th>ELECTRONICS</th>
<th>Year 2017-18</th>
<th>B.Sc (MECs)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TITLE: CONSUMER ELECTRONICS

Unit – I(12hrs)
1. MICROWAVE OVENS – Microwaves (Range used in Microwave ovens)  

Unit – II(12hrs)
2. WASHING MACHINES – Electronic controller for washing machines –  
   Washing machine hardware and software – Types of washing machines  
   Fuzzy logic washing machines Features of washing machines.

Unit – III(12hrs)
7. AIR CONDITIONERS AND REFRIGERATORS - Air Conditioning –  
   Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Unitary and central air conditioning systems – Split air conditioners.

Unit – IV(12hrs)
   HOME/OFFICE DIGITAL DEVICES – Fascimile machine –  
Unit – V (12hrs)


TEXTBOKS:

ELECTRONICS LAB
CONSUMER ELECTRONICS LAB

(At least two Activities should be done)
1. Study of PA systems for various situations – Public gathering, closed theatre / Auditorium, Conference room, Prepare Bill of Material (Costing)
2. Installation of Audio/Video systems – site preparation, electrical requirements, cables and connectors
3. Market Survey of products (at least one from each module)
4. Identification of block and tracing the system. Assembly and Disassembly of system using Toolkit
5. Assembly and Disassembly of system and printer.

NOTE: one activity as directed in practical course is equivalent to 4 experiments.
OBJECTIVES:
- To study about the concept of fiber optic communication.
- To study light source and detectors
- To study the different types of fiber measurements.
- To study the concept of link design
- Introduction to fiber optic communication Receiver
- To study about fiber optic measurement
- To study about Optic Fiber Sensors and applications.

UNIT I: (10Hrs)
Fiber optic communication:
The basic communications systems, Nature of light, Advantages of fiber, Applications of fiber optic communications, Light wave fundamentals- Electromagnetic waves, Dispersion, Pulse distortion and information rate, polarization, Resonant cavities, Reflection at a plane boundary, Critical – angle Reflections ; Optic fiber waveguides: - Step-index fiber, Graded-index fiber, Attenuation. (Elementary Treatment only).

UNIT II: (10Hrs)
Light source and detectors:
Light emitting diodes Operating characteristics, Laser diodes, Laser diode operating characteristics, Distributed feedback laser diode, Optical amplifiers, Light detectors: Principles of photo detection, Photo multiplier, Semi conductor photo diode, PIN photo diode, Avalanche photo diode.

UNIT III: (15Hrs)
MODULATION:
Light Emitting Diode Modulation and circuits, Laser diode modulation and circuits, Analog Modulation Format, Digital modulations formats. SYSTEM LINK DESIGN: Analog system design, Digital system design, power budget analysis.

UNIT IV: (15Hrs)
Optical Fiber Communication Receiver:
UNIT V: (10Hrs)
Fiber Optical Sensors and Applications:

TEXT BOOKS:
2. Opto-electronics and Fiber Optic communications by C.K.Sarkar and D.C.Samkar
3. Fiber Optic Communications by S.Sankar. (New age international)

REFERENCE BOOKS:
1. Fiber Optic communication by senior-PHI
3. Optical fiber communication-Gerd Kaiser
4. Optical communication system-John Gowar.

OUTCOMES:
• This course provides the students with the basic understanding of the concepts and principles of optical fibre communications.
• Line transmission systems, analog and digital transmission system standards.
• On completion of the course, the students will be able to apply the knowledge and principles leant to analyze, design, install and manage typical wired and wireless communication systems and networks.

ELECTRONICS LAB-X
OPTICAL FIBER COMMUNICATION LAB

LAB LIST:

ABOUT FIBER OPTICS.
1: SETTING FIBER OPTIC ANALOG LINK
2: SETTING FIBER OPTIC DIGITAL LINK
3: STUDY OF LOSSES IN OPTICAL FIBER
4: BENDING LOSSES IN FIBER
5: STUDY OF NUMERICAL APERTURE OF OPTICAL FIBER
6: STUDY OF CHARACTERISTICS OF FIBER OPTIC LED.
7: STUDY OF TIME DIVISION MULTIPLEXING (DIGITAL)
Title: Optical fiber communication and it’s applications

MODEL PAPER

SECTION-A

Answer any FIVE of the following: 5x5=25M

1. Explain about Nature of light.
2. Write about semiconductor photo diode.
3. Discuss about power budget analysis.
4. Explain about signal path through data link.
5. Write short note on fiber flow sensor.

6. Define the following terms (i) polarization (ii) Resonant cavities.
7. Explain about PIN photodiode.
8. Write about Optical amplifiers.

SECTION-B

Answer the following: 5x10=50M

1. a) Explain briefly about the advantages and applications of OFC.
   (or)
   b) Discuss about Reflection at a plane of boundary.

2. a) Define Laser principles and explain it’s operating characteristics.
   (or)
   b) Define the following terms (i) APD (ii) PMT.

3. a) Define modulation and explain about Analog formats.
   (or)
   b) Discuss briefly about digital system design.

4. a) Draw the block diagram of optical receiver and explain in detail.
   (or)
   b) Explain numerical aperture measurement using scanning photo detector.

5. a) Discuss briefly about fiber optic sensors.
   (or)
   b) Explain about Long haul communication.