SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Power Electronics and Op Amp Application
Course: US06CELC51 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2023)

Unit: 1 Thyristors

Introduction of Thyristors, Thyristor Type: SCR (Silicon Controlled Rectifier), Triggering device for SCR, Series and Parallel Operation of SCR, DIAC, TRIAC construction, Characteristics, Phase Control of TRIAC using DIAC..

Unit: 2 Commutation Methods of Thyristors

Introduction, Commutation of Thyristors, Classification of forced commutation methods: Class-A, Class-B, Class-C, Class-D, Class-E, Class-F, Auxiliary current commutation.

Unit: 3 Op-amp, Basic op-amp

Op-amp parameter: AC & DC parameter, inverting amplifier, Non-inverting amplifier, Difference amplifier, Subtractor, instrumentation amplifier, Voltage follower, Summing amplifier.

Unit: 4 Filter

Introduction, Comparison of Active & Passive filter, Characteristics and its response, Active low pass filter, Active high pass filter, Active band pass filter, Notch filter, All pass filter.

Basic Text & Reference Books:-

- Power Electronics – P.S.Bhimbra.
- Thyristorized Power Controllers – G.K.Dubey.
- Power Electronics-1 – J.S.Katre.
- Operational Amplifier & Linear integrated Circuits – R.A.Gayakwad
- Electronics Instrumentation and Measurement system – J.G. Joshi
- Digital Principles and its Application – Malvino and Leach

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Microprocessor Interrupts & Interfacing
Course: US06CELC52 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2023)

Unit: 1 **Interrupts**

Input-output execution, 8085interrupts, interrupts instructions and their utilization, restart as software instructions

Unit: 2 **Programmable interface devices**

Programmable Basic concepts in programmable devices, 8155 multipurpose programmable devices, handshake mode 8279 programmable keyboard/display interface.

Unit: 3 **General purpose programmable Peripheral devices**

The 8255A Programmable peripheral interface, 8259A Programmable interrupts controller, direct memory access and 8237 DMA controller.

Unit: 4 **Serial I/O Data communication**

Basic concepts, software control asynchronous serial I/O, 8085 – Serial I/Olines: SOD and SID.

Basic Text & Reference Books: -

- Microprocessor, Architecture, Programming and Application with 8085/8080 – Ramesh S. Gaonkar
- Fundamentals of microprocessors and microcomputers – B. Ram (Dhanpat Rai Pub.)
- Digital Computer Electronics – An Introduction to microcomputers – A.P.Malvino (Tata McGraw Hills)

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Microwave Device & Optical Fiber Communication
Course: US06CELC53 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2023)

Unit: 1 **Microwave Transmission Lines**

Microwave region and band designation; advantages of microwaves; applications of microwaves.Introduction; Transmission Line Equations and Solutions; Reflection Co-efficient and Transmission Co-efficient; Standing wave and Standing wave ratio; Line impedance and admittance; Smith chart; impedance matching

Unit: 2 **Microwave Components, Tubes and Circuits**

Introduction; waveguide microwave junction; microwave T-junction; directional couplers; waveguide terminations; ferrite devices; phase shifters; microwave attenuators; High frequency limitation of conventional tubes: Microwave tubes; Klystron; Magnetron.

Unit: 3 **Basic of Optical fiber**

Introduction, elements of fiber optic communication system, advantages, optical spectral band, nature of light, structure of fiber optic cable, Basic optical laws: reflection, refraction, snell's law, total internal reflection, Acceptance angle, Numerical Aperture.

Unit: 4 **Optical Sources and Detectors**

Optical Sources: Introduction, review of semiconductor physics, Light emitting Diode, structure of LED, Light source material, Surface emitting LED, edge emitter LED, Laser Diode, structure, Comparison of LED Vs LASER, Optical Detectors: introduction, PIN photo detector, Avalanche Photodiode.

Basic Text & Reference Books: -

- Microwave and Radar Engg..:- M Kulkarni (Umesh Publications).
- Microwave Devices and Circuits:- Samuel Liao (PHI).
- Microwave Technology:- Dennis Roddy
- Optical Fiber Communication –Gerd Keiser (4th Edition)
- Optical Fiber Communication: Principles and Practice-J.M Senior (PHI)
- Fiber Optic communication –V.B.Patel (ATUL PRAKASHAN)
- Optical Fiber Communication-D.C Agarwal (wheeler Publication)

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Network Infrastructure Management
Course: US06CELC54 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2023)

Unit: 1 **Network Topology**

Introduction, Applications Topology, Common bus, Star, ring, fully connected, combined topology, OSI model and its various layers, TCP/IP model, Connection Protocols, collision detection.

Unit: 2 **Network Infrastructure**

Design objective, Understanding the networking environment, fundamental design principles, requirement analysis of proposed network infrastructure, network managements components.

Unit: 3 **Network Connecting Devices**

Hubs, bridges, repeaters, multiplexers, routers, brouters, gateways, CSU/DSU structural cabling: network topology and network media, coaxial cable, twisted pair, fiber, wireless, satellite, TIA/EIA structural cabling standards.

Unit: 4 **Network Security**

Security strategy, design and implementation, Security tools: Packet filtering, Encryption, Virtual Private Network, Intrusion Detection System, Password management, firewall policies architecture and functioning.

Basic Text & Reference Books:-

- Data Communication and Networking - B.A.Forouzan
- Computer Networks – A.S.Tannenbaum
- A guide to designing and Implementing : Michael Palmer, Robert Bruce

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Practical's
Course: US06CELC55 (Practical)
(8 - Credit Course – 12 Hours per week)
(Effective from June-2023)

- To study the characteristics of SCR.
- To study Op Amp as a subtractor
- To study Op Amp as an adder
- To study Op Amp as a differentiator.
- To study Op Amp as an integrator
- To study low pass filter
- To study high pass filter
- Practical based on microprocessor 8085.
- Practical based on microprocessor 8085.
- Practical based on microprocessor 8085.
- Practical based on microprocessor 8085.
- Practical related to computer network
- Practical related to computer network
- Project Work related analog or digital Electronics