

SARDAR PATEL UNIVERSITY

S.Y. B.Sc. - 4th sem. (Instrumentation Vocational)

COURSE CODE: - US04CINV21

Electrical Instrument and Power Electronics- II

(Effective from june2019)

Unit 1 : Thyristor

Introduction of thyristor family, SCR characteristics and principal of operation, Method of turning on, Turning off mechanism, Device specification, rating and nomenclature, Gate characteristics, Series – parallel operation of SCR, Triggering of series connected SCRs, Triggering of parallel connected SCRs, String efficiency.

Unit 2 : Low power device

Thyristor, Low power device, UJT, UJT as relaxation, UJT's frequency stability, Triac, Triggering mode, Phase control using Triac, basics of chopper and cycloconverter and its application

Unit 3 : Thyristor Applications

Power control, Static circuit breaker, over voltage Protection, Zero voltage switch, Integral cycle triggering, Time delay circuit, Logic and digital circuit, Pulse circuit. Basic serial and parallel inverter

Unit 4 : Household Application and measuring instrument

Electric oven (O. T. G. microwave), Electric Iron, Flourmill, Washing machine, , Hair dryer; Toaster, and Vibration type applications.

Basic principle and use of Megger, field strength meter, Q meter

Scope of syllabus from:

1. An introduction to Thyristor and their application by M. Ramamoorthy.
2. Home appliance by K. B. Bhatia.
3. Electronic instrument by H S Kalsi

SARDAR PATEL UNIVERSITY

SEM.-4th B.Sc. (Instrumentation Vocational)

COURSE CODE:- US04CINV22

(Effective from June 2019)

OSCILLATORS AND OPTICAL DEVICES

UNIT – 1 : VOLTAGE REGULATOR IC'S AND OSCILLATORS

Introduction voltage regulators, three terminal IC regulator, General purpose regulator IC723
Introduction & classification of Oscillators, Barkhausen criteria, Sinusoidal Oscillators: RC oscillator, Phase shift oscillator, Wein bridge oscillator, LC Oscillator: Tuned circuit oscillator, Hartly oscillator, Colpitt's Oscillators, Crystal Oscillators.

UNIT – 2 : TIMER (555) IC AND APPLICATION

Introduction, salient feature, pin diagram and function diagram, Astable multivibrator and its application: square wave generator, linear ramp generator, VCO, pulse position modulator, frequency shift keying generator, Mono-stable multivibrator and its application: frequency divider, missing pulse detector, pulse width modulation ,linear ramp generator, water level controller, touch switch, bi-stable multivibrator, Schmitt trigger.

UNIT – 3 : OPTICAL FIBERS

Introduction, Single mode Fiber Optics, Multi mode Fiber Optics, Acceptance angle and Numerical aperture, Fiber losses and Dispersions, Step index fiber optics, Graded index fiber optics, Multimode fibers, Pulse dispersion in multimode optical fibers.

UNIT – 4 : OPTICAL FIBER DETECTORS & APPLICATIONS

Detectors: Photo diode, PIN diode, Avalanche Photo diode, Comparisons of fiber optic cable with Metal cable, Fiber Optics construction, Principal of Fiber Optics, Advantage of Fiber Optics, Block diagram of Fiber Optics Communication system, repeaters, Application of Fiber Optics.

Syllabus from:

1. Fiber Optics Communication by D. C. Agraval.
2. Optics Fiber Communication by Gerd Keiser.
3. Laser Theory And Applications by Ghatak.
4. Linear integrated circuits and applications by P.W.Wani

SARDAR PATEL UNIVERSITY

S.Y. B.Sc. - 4th sem. (Instrumentation Vocational)

Subject code: - US04CINV23

PRACTICAL LIST

- 1 DIAC characteristics
- 2 UJT characteristics
- 3 UJT relaxation oscillator
- 4 Phase angle using TRIAC
- 5 SCR characteristics
- 6 TRIAC characteristics

S.Y. B.Sc. - 4th sem. (Instrumentation Vocational)

PRACTICAL LIST

- 1 Phase shift oscillator
- 2 Weinbridge oscillator
- 3 Colpitt's oscillator
- 4 Hartley oscillator
- 5 Astable multivibrator
- 6 Mono stable multivibrator