

PEI5J004 **ADVANCED ELECTRONICS CIRCUITS(3-1-0)**

University Level (80%)

MODULE-I (10Hours)

- 1: Active Filters :Active Filters, Frequency response of Major Active filters, First order low-pass Butterworth filter: Filter Design, Frequency Scaling, Second-order low-pass Butterworth filter: First-order high-pass Butterworth filter, Second-order high-pass Butterworth filter, Band-pass filters: Wide band-pass Filter, Narrow Band-Pass Filter, Band-reject filters: Wide Band-Reject Filter, Narrow Band-Reject Filter, All- Pass filter.
- 2: Oscillators: Oscillators: Oscillator Principles, Oscillator Types, Quadrature Oscillator, Sawtooth wave generator, Voltage-controlled oscillator.
- 3: Comparators: Comparators: basic comparator, zero-crossing detector, Schmitt trigger, comparator characteristics, limitations of Op-Amp as comparators, voltage limiters.

MODULE-II (12Hours)

- 4: BistableMultivibrator: BistableMultivibrator, fixed-bias bistablemultivibrator, Loading, self-biased transistor binary, commutating capacitors, Triggering the binary, Unsymmetrical Triggering of the bistablemultivibrator, Triggering Unsymmetrically through a Unilateral Device, Symmetrical Triggering, Triggering of a Bistable Multi Symmetrically without the Use of Auxiliary Diodes, Schmitt Trigger Circuit (Emitter-coupled BistableMultivibrator).
- 5: Monostable and AstableMultivibrator: MonostableMultivibrator, Gate Width of a Collector-Coupled MonostableMultivibrator, Waveforms of the Collector-Coupled MonostableMultivibrator, Emitter-Coupled MonostableMultivibrator, Triggering of theMonostableMultivibrator. Astable Collector-Coupled Multivibrator, Emitter-coupled astablemultivibrator.

MODULE-III (13Hours)

- 6: Negative Resistance Switching Devices: Voltage Controllable Negative resistance devices, Tunnel Diode operation and characteristics, MonostableAstable, Bistable circuits using tunnel diode, Voltage controlled Negative Resistance Switching Circuits.
- 7: Voltage and Current Time Base Generators: Time-Base Generators, General features of a Time-base signal, Methods of generating a voltage time-base waveform, Exponential sweep circuit, Miller and bootstrap time base generators- Basic principles, Transistor miller time base generator, Transistor bootstrap time base generator, Current Time-Base Generators, A Simple Current sweep, Linearity Correction through adjustment of driving waveform, Transistor current time base generator.
- 8: Specialized IC Applications: IC 555 Timer: IC 555 Timer as a MonostableMultivibrator and its applications, IC 555 Timer as AstableMultivibrator and its applications. Phase Locked Loop: Operating principle of PLL, Phase detectors, Exclusive-OR phase detector, Monolithic phase detector, Instrumentation Amplifier and its applications.

Text Books:

1. *Pulse, Digital and switching Waveforms, Second Edition - Jacob Millman, Herbert Taub and Mothiki S Prakash Rao (TMH Publication).*
2. *OP-Amps and Linear Integrated Circuits- Ramakant A. Gayakwad (PHI Publication).*
3. *Pulse, Switching, and Digital Circuits, David A. Bell, Oxford University Press*
4. *Pulse & Digital Circuits by K.Venkata Rao, K Rama Sudha & G Manmadha Rao, Pearson Education, 2010. (Selected portions)*

Reference Books:

1. *OP-Amps and Linear Integrated Circuits - Robert F. Coughlin, Frederick F. Driscoll (Pearson Education Publication).*
2. *Pulse and Digital Circuits by A. Anand Kumar, PHI*

TENTATIVE
Likely to be Modified