

PET7J009 SYSTEM DESIGN USING INTEGRATED CIRCUITS

3-0-0

MODULE- I

(8 Hours)

Linear IC- Operational amplifier: Introduction to linear ICs, Operational amplifier IC741, Block diagram and characteristics, DC and AC performance; Open loop configurations, Feedback configurations, Inverting, non inverting and differential amplifier, Summer, Subtractor, Integrator, Differentiator, Zero crossing detector, Schmitt trigger, Window detector; Astable and monostable multivibrators; V-I and I-V converters; Filter and its types, Instrumentation amplifier, Precision rectifiers, Logarithmic and antilog amplifiers; multiplier; Op amp voltage regulator, IC linear voltage regulator (series 7800 and 7900 ICs).

MODULE- II (8 Hours)

Other LICs and Data Converters: 555 timer, Block diagram and features, Astable multivibrator, applications, Square wave oscillator, Ramp generator, Triangular waveform generator and Voltage to frequency converter; Monostable multivibrator, applications, Frequency divider, PWM and PPM generators. XR2240 Programmable Timer/Counter,Block diagram and operation, applications,Free running oscillator and frequency synthesizer; PLL565, Principle, Building blocks, applications, Frequency multiplication, Frequency translation, AM and FM detection. Data converters, DAC characteristics, Binary weighted DAC, R-2R DAC, Monolithic DAC-08, ADC characteristics, Flash ADC, Successive approximation ADC, dual slope integrating type ADC, Monolithic ADC AD670,Variable Voltage Regulators(LM317).

MODULE- III (8 Hours)

Digital Integrated Circuits: Digital IC characteristics, Digital IC families,RTL and DTL, HTL, I²L, TTL, ECL, MOS and CMOS logic circuits, Comparison of digital IC families.

MODULE- IV (8 Hours)

Design of sequential machines: Analysis and design of synchronous sequential machines, Mealey and Moore machines, State table, State diagram, State reduction and assignments, Analysis and design of asynchronous sequential logic, Race conditions, Design problems from specifications, Hazards in combinational and sequential circuits.

ADDITIONAL MODULE (Terminal Examination-Internal) (8 Hours)

Processor and control unit design: Registers, Register transfer logic, inter register transfer, bus transfer and memory transfer, Arithmetic logic and shift micro operations, Macro operations; Processor logic design, Processor organization, Bus organization, Processor unit employing a scratch pad memory, Accumulator, Design of ALU, Design of status register, Design of processor unit with control variables, Design of accumulator, Control logic design, Single flip flop/state method, Sequence register and decoder method, PLA control, Micro program control.

Text Books

- 1) Operational Amplifiers and Linear Integrated Circuits, Robert. F. Coughlin and Frederick F. Driscoll, PHI Learning Pvt. Ltd, Sixth Edition, 2008.
- 2) Digital Logic and Computer design, M. Morris Mano, PHI Learning Pvt. Ltd, 2008

Reference Books

- 1) Opamp and Linear Integrated Circuits, Ramakant A. Gayakwad, PHI Learning Pvt. Ltd, Fourth Edition, 2008.
- 2) Digital Design, M. Morris Mano and Michael D. Ciletti, PHI Learning Pvt. Ltd, Fourth Edition,2008.