



Shree H. N. Shukla College of Science

(Affiliated to Saurashtra university)

Nr. Lalpari Lake, B/h Marketing Yard, Rajkot-360 003

Ph. No. : 9099063150, 97277 53360

Paper: Physics-503

(Solid State Electronics)

UNIT 1: (12 hour : 14 Mark)

Multi-stage Transistor Amplifiers: Multistage Transistor Amplifier, Role of Capacitors in Transistor Amplifiers, RC coupled Transistor Amplifier, Transformer Coupled Amplifier, Direct coupled Amplifier, Comparison of Different types of coupling, Numerical Problems.

Transistor Audio Power Amplifiers: Transistor Audio Power Amplifier, Difference between Voltage and Power amplifier, Performance Quantities of power amplifier, Classification of Power amplifier, Expression for Collector Efficiency, Efficiency of Class A Amplifier, Maximum Efficiency of Transformer Coupled Class A Power amplifier, thermal Runaway, Heat sinks, Mathematical Analysis, Push pull Amplifier, Complementary Symmetry Amplifier, Numerical Problems.

UNIT 2: (12 hour : 14 Mark)

Solid State Switching Circuits : Switch, Mechanical switch, Electronic Switches, Advantages of electronic switches, switching transistors, switching action of Transistor, Multivibrators, Types of Multivibrators, Transistor Astable Multivibrators, Transistor Monostable Multivibrators, Transistor Bistable Multivibrators, Differentiating circuit, Integrating circuit, Clipping circuits, Application of Clippers, Basic idea of a clamper, clamping circuits, Numerical Problems.

UNIT 3: (12 hour : 14 Mark)

Regulated D.C. Power Supply: Ordinary D.C. power supply, Important terms, Regulated Power supply, Types of voltage regulators, Zener diode as a voltage regulator, Transistor series



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voltage regulator, Series feedback voltage regulator, Short-circuit protection, Transistor shunt voltage Regulator, Numerical Problems.

Integrated Circuits: Integrated Circuits, Advantages & Disadvantages of ICs, Scale of Integration, Classification of ICs, Comparison between different ICs, IC Symbol, Operational Amplifier, Differential Amplifier, Basic circuit of Differential Amplifier, Operation of Differential Amplifier, Common-mode and Differential-mode signals, Common-mode Rejection Ratio, DC Analysis of Differential Amplifier, Ideal Operational Amplifier, OP-AMP Applications, Linear Amplifier, Adder, Subtractor, Integrator, Differentiator, Comparator, Numerical Problems.

UNIT 4: (12 hour : 14 Mark)

Transducer : Transducer, Classification of Transducers, Resistive Position Transducer, Resistive Pressure Transducer, Inductive Pressure Transducer, Capacitive Pressure Transducer, Self-generating Inductive Transducers, Linear Variable Differential Transformer(LVDT), Piezoelectric Transducer Strain Gauge, Temperature Transducer, Resistance temperature detectors, Thermistor, Thermocouples, Photoelectric Transducer, Various Types of Microphones, Carbon Microphone, Ribbon Microphone, Moving Coil Microphone, Crystal Microphone, Ceramic Microphone, Numerical Problems.

UNIT 5: (12 hour : 14 Mark)

Electronic Instruments: Analog and Digital Instruments, Functions of Instruments, Electronic versus Electrical Instruments, Essentials of an Electronic Instrument, The Multimeter, Rectifier type AC meter, Electronic Voltmeter, Electronic voltmeter for Alternating currents, Digital voltmeter,



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Cathode Ray Oscilloscope, Frequency Determination, Application of CRO.

Basic Reference Books for above units :

1. Principles of Electronics By V.K.Mehta & Rohit Mehta. Publisher:S. Chand &Company Ltd.
2. Basic Electronics By B.L.Theraja, Publisher:S. Chand & Company Ltd

Digital circuits & Applications:

Combinational logic circuits : Introduction, Half adder; Full adder; Multiplexer: 16 to 1 Multiplexer; The 74150; Multiplexer Logic; Bubbles on Signal Lines; Nibble Multiplexers, Demultiplexer: 1 to 16 Demultiplexer; The 74154, 1 of 16 Decoder, BCD To Decimal Decoders; The 7445, Encoder, The 74147.

Sequential logic circuits: Introduction, RS flip-flop, Clocked RS flip-flop, D flip-flop, JK flip-flop JK Master- slave flip-flop.

IC 555 timer and its application as astable and monostable Multivibrator. Numerical Problems.

Basic Reference Book:

Digital Principles and Applications By Malvino & Leach, Publisher: Tata McGraw Hill Publishing Company Limited. 4TH Edition.

Other Reference Books:

1. Electronic Devices & Circuits By Allen Mottershad, Publisher: Prentice-Hall of India Pvt. Ltd., Delhi
2. Electronic Devices & Circuits Theory by Boylestead & Nashelsky
3. Handbook of Electronics By Kumar & Gupta, Publisher: Pragati Prakashan, Meerut, India
4. Principal of Electronics By Malvino, Publisher: TMG
5. Modern Digital Electronics By R.P.Jain
6. A Text book of Digital Electronics By R.S.Sedha, Publosher:S.Chand