543M3010

Electronics Laboratory　電子學實驗

Lab 0: Introduction to the Course and Instruments

　　Dual Trace Oscilloscope, Function Generator, DC Power Supply, Digital Multimeter

Lab 1: DC Circuits and Capacitors

　　Ohm's Law , Voltage Divider, RC Circuit, Low-pass Filter, High-pass Filter, Filter Application, LC Filter

Lab 2: Diode Circuits

　　The Diode, LC Resonant Circuit, Rectifier Circuits, Diode Clamp, Diode Limiter

Lab 3: Bipolar Transistors

　　Transistor Junctions are Diodes, Emitter Follower, Input and Output Impedance of Follower, Single-Supply Follower, Transistor Current Gain, Current Source, Common-emitter Amplifier, Emitter Follower Buffer, Transistor Switch

Lab 4: Field-Effect Transistors

　　 FET Characteristics, FET Current Sources, Source Follower, FET as Variable Resistor

Lab 5: Operational Amplifier I: Idealized View

　　Open-Loop Test Circuit, Inverting Amplifier, Non-inverting Amplifier, Follower, Current Source, Current to Voltage Converter, Summing Amplifier, Push-pull Buffer

Lab 6: Operational Amplifier III: Positive Feedback, Good and Bad

　　Two Comparators, RC Oscillator, 555 IC Oscillator, Sawtooth Oscillator, Triangle Oscillator, Sine Wave Oscillator: Wien Bridge, Follower, Op Amp Instability

Lab 7: Voltage Regulators

　　 The 723 Regulator, Three Terminal Fixed Regulator, Adjustable Three-terminal Regulator: 317, Voltage References, "Crowbar" overvoltage protection, Integrators, Differentiators

Lab 8: Digital Gates

　　Input & Output Characteristics of Integrated Gates: TTL & CMOS, Applying NANDs to Generate Particular Logic Functions, Two Inverters, CMOS NAND, CMOS Three-State

Lab 9: Flip Flops

　　 A primitive flip-flop: NAND Latch, D Type, J-K Type, J-K in Counters, Shift Register, 7490 Decade Counter, 7447 BCD to 7 Segment Decoder

Lab 10: A/D and D/A

　　Weighted-Resistor DAC, R-2R Ladder DAC, DAC0800 8-Bit Digital-To-Analog Converters, ADC0804 8-Bit Analog-To-Digital Converters