MOSIC

Week	Theory	
	Lecture Day	Topic
1st	1	Introduction to IC technology
	2	MOS Transistor enhancement mode
	3	MOS Transistor Depletion mode
	4	fabrication of NMOS
2nd	5	CMOS Devices
	6	BiCMOS devices
	7	Equivalent circuit for MOSFET
	8	Equivalent circuit for CMOS
3rd	9	MOS device design equations
	10	MOS transistor
	11	Evaluation aspects of MOS transistor
	12	threshold voltage
4th	13	MOS transistor transconductance
	14	MOS transistor outputconductance
	15	figure of merit,
	16	determination of pull-up to pull-down ratio for an n-MOS inverter driven by another n-MOS inverter
5th	17	determination of pull-up to pull-down ratio for an n-MOS inverter driven by one or more pass transistor
	18	alternative forms of pull-up
	19	CMOS-inverters
	20	BiCMOS-inverters
6th	21	Latch up in CMOS circuitry
	22	BiCMOS Latch up susceptibility
	23	Basic physical design of simple logic gates using n-MOS
	24	Basic physical design of simple logic gates using p-MOS
7th		**Minor Test 1**
8th	25	Basic physical design of simple logic gates using c-MOS
	26	CMOS logic gate design considerations,
	27	CMOS logic structures
	28	clocking strategies
9th	29	Resistance estimation
	30	capacitance estimation
	31	Inductance estimation
	32	switching characteristics
10th	33	CMOS gate transistor sizing
	34	power dissipation
	35	Crystal growth
	36	wafer preparation
11th	37	Epitaxy
	38	oxidation
	39	Lithography
	40	etching
12th	41	diffusion
	42	dielectric and poly-silicon film deposition
	43	ion implantation

	44	yield and reliability
13th	45	metalization
	46	Incrementer / decrementer
	47	left/right shift serial register
	48	left/right shift parallel register
14th	**Minor Test 2**	
15th	49	comparator for two n-bit number
	50	a two-phase non-overlapping clock generator with buffered output on both phases
	51	design of an event driven element for EDL system
	52	Revision

BASICS OF ELECTRONICS ENGINEERING

Week	Theory	
	Lecture day	**Topic(including assignment/test)**
1	1	Energy Band in solid
	2	Semiconductor materials
	3	Classification of semiconductors
	4	Energy distribution of electrons
2	5	Mass action law
	6	Effect of temperature on semiconductor
	7	Charge density in a semiconductor
	8	Drift current
3	9	Diffusion current density
	10	Total current density
	11	Conductivity
	12	PN Junction theory
4	13	Depeltion theory
	14	V-I equation and characteristics
	15	Resistance levels
	16	Piece wise linear characteristics and equivalent circuit
5	17	Zener diode
	18	LED
	19	Photodiode
	20	Transition and Diffusion Capacitance
6	21	Reverse recovery time
	22	Varactor Diode
	23	Load line analysis of diode circuit
	24	Half wave rectifier
7		**I st Minor Test**
8	25	Full wave rectifier
	26	Numerical problems on rectifier
	27	Clippers
	28	Clampers
9	29	**Assignment Questions**
	30	Voltage multiplying circuits
	31	Zener voltage regulator
	32	BJT introduction
10	33	Physical structure and operation of BJT
	34	Transistor equations
	35	Transistor amplifying action
	36	Types of configuration and their characteristics curve
11	37	Thermal Runway
	38	Heat sink
	39	Operating point of transistor
	40	Requirement of biasing
12	41	Fixed bias and potential divide circuit
	42	FET,Types,construction,equations and curves
	43	Comparison of FET andf JFET
	44	MOSFET
13	45	MOSFET as an amplifier
	46	Introduction to Thermistor
	47	Optocoupler
	48	SCR
14		**IInd Minor Test**
15	49	DIAC
	50	**Assignment Evaluation**
	51	TRIAC
	52	UJT

DIGITAL SYSTEM DESIGN AND DIGITAL SYSTEM DESIGN LAB

Week	Theory		Practical	
	Lecture day	**Topic(including assignment/test)**	**Practical day**	**Topic**
1	1	Introduction to Computer-aided design tools for digital systems	1	Design all gates using VHDL.
	2	Hardware description languages		
	3	Introduction to VHDL		
	4	Data objects		
2	5	Classes and data types	2	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. half adder b. full adder
	6	Operators		
	7	Overloading, logical operators		
	8	Types of delays		
3	9	Entity and Architecture declaration	3	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. multiplexer b. demultiplexer
	10	Introduction to behavioral model		
	11	Introduction to dataflow model		
	12	Introduction to structural model		
4	13	Assignment statements	4	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. decoder b. encoder
	14	Sequential statements and process		
	15	Conditional statements		
	16	Case statement		
5	17	Array and loops	5	Write a VHDL program for a comparator and check the wave forms and the hardware generated
	18	Resolution functions		
	19	Packages and Libraries		
	20	Concurrent statements		
6	21	Subprograms	6	**First viva-voce**
	22	Application of Functions and Procedures		
	23	Structural Modeling		
	24	Component declaration		
7		**I st Minor Test**		
8	25	Structural layout and generics	7	Write a VHDL program for a code converter and check the wave forms and the hardware generated
	26	VHDL Models		
	27	Simulation of combinational circuits such as Multiplexers		
	28	Demultiplexers,		
9	29	**Assignment Questions**	8	Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated
	30	Encoders		
	31	Decoders		
	32	Code converters		
10	33	Comparators	9	Write a VHDL program for a counter and check the wave forms and the hardware generated
	34	Implementation of Boolean functions etc.		
	35	VHDL Models		
	36	Simulation of Sequential Circuits		
11	37	Shift Registers	10	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. register b. shift register
	38	Counters etc		
	39	Basic components of a computer, specifications		
	40	Architecture of a simple microcomputer system		
12	41	Implementation of a simple microcomputer system using VHDL	11	Implement any three (given above) on FPGA kit
	42	Programmable logic devices		
	43	ROM,		
	44	PALs,		
13	45	CPLDs	12	Implement any three (given above) on CPLD kit
	46	FPGA		
	47	PLAs		
	48	GAL		
14		**IInd Minor Test**		
15	49	PEEL	13	**Second viva-voce**
	50	**Assignment Evaluation**		
	51	Design implementation using CPLDs		
	52	Design implementation using FPGAs		

MICROWAVE AND RADAR ENGINEERING (EE - 302E)

Week	Theory		Practicals	
	Lecture Day	Topic (Including Assignment/Test)	Practical Day	Topic
1st	1	Introduction, comparison with transmission lines	1	Study of wave guide components.
	2	Propagation in TE mode		
	3	Propagation in TM mode		
	4	Rectangular wave guide		
2nd	5	TEM mode in rectangular wave guide	2	To study the characteristics of reflex Klystron and determine its timing range.
	6	Characteristic Impedance		
	7	Introduction to circular waveguides		
	8	Introduction to planar transmission lines		
3rd	9	Directional couplers	3	To measure frequency of microwave source and demonstrate relationship among guide dimensions, free space wave length and guide wavelength
	10	Tees		
	11	Hybrid ring		
	12	S-Parameters		
4th	13	Attenuators	4	To measure VSWR of unknown load and determine its impedance using a smith chart
	14	Cavity Resonators		
	15	Mixers & Detectors		
	16	Matched Load		
5th	17	Wave meter	5	To match impedance for maximum power transfer using slide screw tuner.
	18	Phase Shifter		
	19	Ferrite devices: Isolators		
	20	Circulators		
6th	21	Limitation of conventional tubes	6	**First Viva -Voce**
	22	Construction of Klystron amplifier		
	23	Operation and properties of Klystron amplifier		
	24	Assignment I		
7th		**……Ist Minor Test……..**		
8th	25	Reflex Klystron	7	To measure coupling and directivity of direction couplers.
	26	Magnetron		
	27	TWT, BWO		
	28	Crossed field amplifiers		
9th	29	Varactor diode	8	To measure insertion loss, isolation of a three port circulator.
	30	Tunnel diode		
	31	Schottky diode		
	32	GUNN diode		

10th	33	IMPATT diode	9	To measure the Q of a resonant cavity.
	34	TRAPATT diode		
	35	PIN diodes		
	36	MASER		
11th	37	Parametric amplifiers	10	To study the V-I characteristics of GUNN diode.
	38	Power measurement using calorimeter		
	39	Power measurement using bolometers		
	40	Measurement of SWR		
12th	41	Measurement of Frequency	11	To measure VSWR, insertion losses and attenuation of a fixed and variable attenuator.
	42	Measurement of wavelength		
	43	Measurement of impedance		
	44	Microwave bridges		
13th	45	Block Diagram and operation	12	**Second Viva Voce**
	46	Radar Frequencies		
	47	Simple form of Radar Equation		
	48	Assignment II		
14th	**……IInd Minor Test……..**			
15th	49	Prediction of Range Performance		
	50	Pulse Repetition frequency		
	51	Range Ambiguities		
	52	Applications of Radar		

TELEVISION ENGINEERING (EE-308-E)

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Week	Theory	
	Lecture Day	Topic (Including Assignment/Test)
Unit1-Elements of a Television System		
1st	1	Picture transmission, Sound transmission
	2	Picture reception, Sound reception
	3	Synchronization, Receiver controls, Color television.
	4	Problems and Solutions
2nd	5	Gross structure, Image continuity
	6	No. of scanning lines, Flicker,
	7	Fine structure, Tonal gradation
	8	Problems and Solutions
Unit2- Composite Video Signal		
3rd	9	Video signal dimensions
	10	Horizontal sync details, Vertical sync details
	11	Scanning sequence details, functions of vertical pulse train
	12	Sync details of 525 line system.Problems and Solutions
Unit3- Signal Transmission And Channel Bandwidth		
4th	13	Amplitude Modulation, Channel bandwidth
	14	Vestigial side band transmission, Transmission efficiency
	15	Complete channel bandwidth, Reception of VSB Signals
	16	Problems and Solutions
5th	17	Frequency modulation, FM channel bandwidth,
	18	Channel bandwidth for color transmission
	19	Allocation of frequency bands for television signal transmission, Television standards
	20	Problems and Solutions
Unit4- The Picture Tube		
6th	21	Monochrome picture tube
	22	Beam deflection ,Screen phosphor, face plate,
	23	Picture tube characteristics
	24	Problem and Solution
7th	**1st Minor Test**	
8th	25	Picture tube circuit controls. Basic Principle of television Camera Tubes
	26	Image orthicon
	27	Camera Tube -Vidicon
	28	Problems and Solutions & Assignment 1
Unit5- Basic Television Broadcasting		
9th	29	Television transmitter, Positive & Negative modulation.
	30	Television Receiver Section, VSB Correction ,
	31	Choice of intermediate frequencies,Picture tube circuitry & controls
	32	Problems and Solution

10th	33	Sound signal separation, Sound section
	34	Sync processing & AFC circuit
	35	Vertical Deflection circuit, Horizontal deflection
	36	Problems and Solution
11th	37	Television Transmission antennas
	38	Television Receiver sections, television receiver antennas
	39	Color television antennas
	40	Problems and Solution
Unit6- Essentials of Color Television		
12th	41	Compatibility, natural light, color perception,
	42	Three color television camera, the luminance signal,
	43	Values of Luminance & color difference signals on Colors
	44	Problems and Solutions
13th	45	Color television display tubes - Delta gun,
	46	PIL, Trinitron Camera Tube .
	Unit7- Color signal Transmission and Reception	
	47	Color signal transmission, bandwidth for color signal transmission.
	48	Problems and Solutions
14th	**2nd Minor Test**	
Unit8- Television Applications		
15th	49	Television via satellite, Remote Control (Electronic control system),
	50	Introduction to Digital TV Technology and their merits, HDTV.
	51	Problems and Solutions
	52	Assignment-II