Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Electronics

Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) SEM-I (July 2016 -Dec2016)

Subject - : Components and Networks

Teacher - Dr.Pradeep Purey/Prof. Richa Joshi

Day/Lecture	Unit	Topic
1	Unit:1	Circuit symbols
2		Classification registor & construction & working principle
3		Linear and nonlinear, fixed and variable type
4		applications of passive component
5		Resistors & Color Coding,
6		Types of Inductors, Transformers,working principal
7		Types of Switches
8		Relays(Electromagnetic
9		Thermistor & charctristic LDR,working
10		REVISION
11		Micro- Phone Loud-Speakers.
12	Unit:2	Working of capacitors: - Capacitance
13		Capacitor Specifications
14		Classification of Capacitor
15		Fixed (Mica, Paper 5 Ceramic 6 Plastic, 7 Electrolytic etc.),
16		Variable capacitor (Trimmer, Padder, Gang)
17		Stray Capacitance, Leakage Resistance
18		Testing of Condenser,
19		Area of Application
20		Problem related to Electrical Energy Storage
21	Unit:3	Concept of Ideal and Practical Voltage and Current Sources,
22		Internal Resistance, AC and DC Sources,
23		Ohms Law, AC Currents & Voltages,
		NUMRICAL Problem Based On Theorms
26		Expression for RMS value & Mean Value
27		j Operator, study of LR, CR
28		Series & Parallel resonance circuit,
29		Expression for Q factor & Band width in resonance circuit
30		Phase relationship between Current & Voltage in different circuits.
31		Numerical on Quality Factor
32		Power Factor, Bandwidth Calculations
33	Unit:4	Kirchhoff's Current and Voltage Law
34		Application of KVL& KCL to simple DC Resistive Networks
35		Thevenin's Theorems
36		Norton's Theorems
37		Problem related to corresponding equivalent of simple Resistive Networks
38		Superposition Theorem
39		Maximum Power Transfer Theorem
		NUMRICAL Problem Based On Theorms

40		Loop Current, Node Voltage Analysis Methods.
41	Unit:5	Types of filters
42		Choke input (inductor) filter
43		Shunt Capacitor filter, L section,
44		π section and T filters
45		Low Pass, High Pass filters,
46		Numerical
47		Band Pass and Band Reject Filters
48		NUMRICAL Problem Based On Theorms
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Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Electronics

Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) SEM-I (July 2016 -Dec2016)

Subject - PRACTICALS

Teacher - Dr.Pradeep Purey/Prof. Richa Joshi

Day/Lecture	Topic
1	Identification of Components / Tools a) Minimum 10 different types of components must be given. b) Identification based on visual inspection / data sheets be carried out.
2	Multimeter (Analog and Digital) a) Measurement of AC/DC voltage and Current - on different ranges.
3	Multimeter (Analog and Digital) a) Measurement of R.
4	Multimeter (Analog and Digital) a) Testing of L, C, Diodes & Transistors.
5	Study of Function Generator / CRO a) Understand how to use Function Generator / CRO.
6	Study of Function Generator / CRO a) Study of Front panel controls.
7	Study of Function Generator / CRO a) Measurement of Amplitude and Frequency of different Waveforms.
8	Study of Function Generator / CRO a) Demonstrate the use of Component Testing.
9	Verification of KCL / KVL
10	Verification of Thevenin's Theorem
11	Verification of Norton'sTheorem.
12	Verification of Maximum Power Transfer
13	Verification of Superposition
14	Charging and Discharging of Capacitors in R-C Circuits.

Maharaja Ranjit Singh College of Professional Sciences, Indore
Department of Electronics
Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) SEM-III (July 2016 -Dec2016)
Subject - ANALOG ELECTRONICS AND OP-AMP
Teacher - Dr. Pradeep Purey/Prof. Richa Joshi

Day/Lecture	Unit	Topic
1	Unit I:	Rectifiers: Half wave,
2	Power Supplies	Full wave and Bridge Rectifiers
3		Efficiency, Ripple factor and voltage regulation
4		Block Diagram of Regulated Power Supply
5		Series and Shunt Regulation.
6		Three terminal Regulators (78XX and 79XX).
7	Unit II:	JFET, Construction and Characteristics
8	FETs & Amplifiers	Depletion and Enhancement type
9		MOSFET, Construction and Characteristics
10		Depletion and Enhancement type
11		MOSFET, problems related to pinch off voltage
12		IDSS, Vgs, transfer characteristics
13		μ, rd, gm, ID, IDSS relation for FET and threshold voltage.
14		Transistor as an amplifier:
15		Class A,Class B,
16		Class AB and Class C operation and their Applications
17		Class B push pull amplifier
18		Noise and Distortion in Amplifier
19	Unit III:	concept of feedback
20	Feedback and Oscillators	General theory of feedback,
21		classification of feedback
22		closed loop gain, open loop gain and return difference,
23		stabilization of gain
24		Negative feedback in amplifier,
25		Effect of negative feedback on gain,
26		non linear distortion,
27		Band width, Noise, Input and output impedance,
28		Topologies of feedback
29		Positive feedback and Barkhausen criterion for oscillator,
30		RC phase shift oscillator
31		wien Bridge oscillator, 13 RF oscillator
32		effect of L and C on RF oscillator frequency
33		Hartley oscillator, colpitts oscillator,
34		crystal oscillator
35	Unit IV:	Basic Building Block of Op-Amp
36	Operational Amplifier	Differential amplifier and its types
37		DC and AC analysis of Differential amplifier,
38		Concept of Virtual ground.

39		Op-amp Parameters:
40		Concept of ideal op-amp,
41		Input and output offset voltage, Input offset current,
42		Input bias current, CMRR, PSRR and slew rate,
43		open loop gain, Input and output resistance
44		frequency response. Calculation of CMRR and Slew rate
45	Unit V:	Voltage Amplifier
46	Linear and Non linear	Inverting and non inverting amplifier
47	applications of op-amp	summing amplifier
48		Differential and Instrumentation Amplifiers
49		Comparator, Zero crossing
50		limit detector. Schmitt trigger
51		Differentiator, Integrator
52		and logarithmic amplifier and
53		problems related to above topics.

Day/Lecture	Topic
	Maharaja Ranjit Singh College of Professional Sciences, Indore
	Department of Electronics
	Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) SEM-III (July 2016 -Dec2016)
	Subject - PRACTICALS
	Teacher - Dr.Pradeep Purey/Prof. Richa Joshi
1	Study of Half Wave, Full Wave and Bridge Rectifiers.
2	Study of output and transfer characteristics of JFET/MOSFET.
3	Study of Wien Bridge Oscillator.
4	Study of Hartley Oscillator.
5	Study of Colpitt's Oscillator.
6	Op-Amp 741C as an inverting and non- inverting amplifier.
7	Op-Amp 741C as adder and Subtractor.
8	Op-Amp as Voltage Comparator.
9	Op-Amp as Differential and Instrumentation Amplifier.
10	Op-Amp as Integrator and Differentiator.

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Lesson Plan - B
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Day/Lecture	Unit
1	Unit:1
2	Microprocessor
3	Introduction
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5	
6	Unit II:
7	Programming
8	
9	
10	
11	
12	
13	Unit III:
14	Interrupts
15	
16	
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19	Unit IV:
20	Memory
21	Interfacing
22	
23	
24	Unit V:
25	Peripheral
26	Interfacing
27	
28	
29	
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Department of Electronics

. Sc. (IT+ELEX,PHY+ELEX) SEM-V(July 2016 -Dec2016)

ct - MICROPROCESSOR AND INTERFACING

acher - Dr.Pradeep Purey/Prof. Richa Joshi

Topic
Microprocessor architecture
Block diagram, pin out diagram,
LU and Control unit
concept of Fetch Cycle, Execution cycle
machine cycle and instruction cycle.
8085 based instructions,
Data Transfer, Stack,
Arithmetic and Logical Branch I/O and machine control instruction and timing diagram,
Stack pointer,
Stack related instruction,
code conversion, subroutines
conditional/unconditional call and return instructions.
Hardware and Software interrupt
Maskable and Non Maskable,
vectored and Non vectored interrupt,
priority interrupt and interrupt service routine DMA,
Memory mapped I/O and I/O mapped I/O techniques,
In and Out instruction & Timing diagrams
1 RAM, ROM, EPROM,
2 Memory interface,
3 Interfacing ROM
4 2Kx8, 4Kx8, 5 Interfacing. RAM 2Kx8 and 4Kx8.
Timing diagram for memory read and memory write Instruction and T Cycle.
Interfacing peripheral devices
programmable,peripheral, interface, 8255 - Internal architecture,
control register and control word 8255.
Functional description-
Operational programming in mode 0,
mode 1 and mode 2.

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Electronics

Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) SEM-V(July 2016 -Dec2016)

Subject - PRACTICALS

Teacher - Dr.Pradeep Purey/Prof. Richa Joshi

Day/Lecture	Topic
1	Using Microprocessor 8085:-
2	Addition and Subtraction of 8 bit Numbers.
3	Addition and Subtraction of 16 bit Numbers.
4	Addition of 8 bit numbers in BCD Code.
5	Addition of two string of numbers placed in memory location.
6	Multiplication and Division of 8 bit and 16 bit numbers.
7	Find the Largest and Smallest number from a given set of numbers loaded in the memory.
8	To arrange the numbers in Ascending and Descending order.
9	Find 1's & 2's Complement of Numbers.
10	Block Data Transfer in Memory.
11	Display 'HELP'
12	Interfacing of Peripheral IC 8255 with 8085 Microprocessor.

Maharaja Ranjit Singh College of Professional Sciences, Indore
Department of Electronics
Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) SEM-II (Jan 2017 -May 2017)
Subject - **:** **Electronics Devices**
Teacher - Dr. Pradeep Purey/ Richa Joshi

Day/Lecture	Unit	Topic
1	1	BASIC OF Conductors,
2		Semiconductors and Insulators.
3		Their classification on the basis of Band Theory
4		Intrinsic and Extrinsic semiconductor
5		Diode current equation , Drift & Diffusion.
6		RIVISION
7	2	P-N junction- Forward and Reverse bias of Diode.
8		Concept of recombination of carriers,
9		temperature variation of Forward and Reverse Current through the P-N Junction.
10		Characteristics of Forward & Reverse Bias Diode
11		Dynamic and Static Resistances,
12		Voltage dependent Junction Capacitance of a P-N junction.
13		REVISION
14		Zener Diode,
15		Its construction and characteristics. Temperature coefficient of Zener Diode
16	3	Schottky Diode
17		Power Diode
18		Tunnel Diode
19		LED,
20		Solar Cell
21		Photodiodes.
22		BJT, construction and characteristics in different configuration
23		comparative merits and demerits,
24	4	biasing of transistor: different methods
25		load line, Q point and
		Numerical
26		Thermal stability
27		Transistor as a black box: h-parameter concept only.
28		Qualitative analysis of h-parameter model in CE, CB and CC mode.
		REVISION
29	5	SCR Construction, WORKING
30		Characteristics and uses of SCR,
31		DIAC,
32		TRIAC
33		UJT and Optocoupler devices
		RIVISION

Day/Lecture	Topic
	Maharaja Ranjit Singh College of Professional Sciences, Indore
	Department of Electronics
	Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) SEM-II (Jan 2017 -May 2017)
	Subject - PRACTICALS
	Teacher - Dr.Pradeep Purey/Prof. Richa Joshi
1	Study of Forward and Reverse Bias characteristics of PN Junction Diode.
2	Study of Forward and Reverse Bias characteristics of LED.
3	Study of Breakdown Characteristics and Voltage Regulation action of Zener Diode.
4	Study of Forward and Reverse Bias Characteristics of SCR.
5	Study of Forward and Reverse Bias Characteristics of DIAC.
6	Study of Forward and Reverse Bias Characteristics of TRIAC.
7	Study of Forward and Reverse Bias Characteristics of UJT.
8	To study the characteristics of PNP transistor in CB and CE configuration.
9	To study the characteristics of NPN transistor in CB and CE configuration.
10	To study the characteristics of Emitter Follower.
11	To study photo diode characteristics
12	To find the Q- point of a bipolar junction transistor
13	To study transistor as a switch
14	To study I-V characteristics of a solar cell.

Maharaja Ranjit Singh College of Professional Sciences, Indore
Department of Electronics
Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX) IV (Jan 2017 -May2017)
Subject - DIGITAL ELECTRONICS
Teacher - Dr.Pradeep Purey/Prof. Richa Joshi

Day/Lecture	Unit	Topic
1	Unit I : Number Systems,	Decimal, Binary,Octal,
2	Codes and Logic	Hexadecimal number systems and their interconversions,
3	Gates	Signed and fractional binary number representation.
4		BCD, Excess-3, Gray, ASCII & EBCDIC Codes.
5		Basic logic gates & Derived gates(AND, OR, NOT, NAND, NOR, XOR, XNOR):
6		Symbols, Truth Tables
7		Circuit diagrams using switches, diodes and transistors.
8	Unit II:	Boolean Algebra, 2 minterms, maxterms,
9	Boolean Algebra	Boolean expression in SOP form and POS form,
10	and K-map	conversion of SOP/POS expression to its standard SOP/POS form,
11		Demorgan's Theorem. Universal Gates,
12		Simplification of Logic equations using laws of Boolean algebra and
13		Karnaugh map (upto 4 variables)
14	Unit III:	Binary addition, subtraction,
15	Arithmatic &	multiplication & division,
16	Combinational	1's and 2's complement
17	Circuits	Half adder and Full Adder,
18		Half Subtractor and Full Subtractor
19		Binary Adder, 2's complement Adder/Subtractor circuit,
20		Digital Comparator
21		Multiplexer, Demultiplexer,
22		Encoder, Decoder and code converters.
23	Unit IV:	RS & D Latches, RS, D, Flip Flops,
24	Sequential	JK & T Flip Flops
25	Circuits	Concept of racing and JK Master-Slave Flip Flops,
26		Registers & Counters and their different types.
27	Unit V:	Basic D/A Converters: R-2R,
28	A/D &	Binary Weighted Resistor type
29	D/A Converter	A/D Converters: Counter, Ramp,
30		Flash and Successive Approximation.
31		Sample and Hold Circuits: .
32		Basic Concept and Working
33		NUMERICAL BASED ON k MAP
34		RIVISION

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Electronics

Lesson Plan - B. Sc.(IT+ELEX,PHY+ELEX) IV (Jan 2017 -May2017)

Subject - PRACTICALS

Teacher - Dr.Pradeep Purey/Prof. Richa Joshi

Day/Lecture	Topic
1	Study of Basic Logic Gates and Universal Gates.
2	Verification of Demorgan's Theorem.
3	Study of Binary Half and Full Adder Circuit.
4	Study of Binary Half and Full Subtractor Circuits.
5	Study of code conversion binary to gray and gray to binary Circuits.
6	Study of 4 bit Parity Generator/ Checker Circuits.
7	Study of Multiplexer and Demultiplexer Circuits.
8	Study of Decoder and Encoder Circuits.
9	Study of R-S, D and J-K flip flop.
10	Study of 4 - Bit Ripple Up/Down Counter.
11	Study of Left and Right Shift Registers.
12	Study of Digital Comparator.
13	Study of D/A Conversion.
14	Study of A/D Conversion.
15	Study of Ring Counter and Decade Counter.

Maharaja Ranjit Singh College of Professional Sciences, Indore
Department of Electronics
Lesson Plan - B. Sc.(IT+ELEX,PHY+ELEX) VI (Jan 2017 -May 2017)
Subject - ELECTRONICS COMMUNICATION & INSTRUMENTATION
Teacher -Dr.Pradeep Purey/Prof.Richa Joshi

Day/Lecture	Unit	Topic
1	Unit I :	Measurement and Error Definition,
2	Measuring	Types of errors
3	Instruments	probability of errors,
4		limiting errors.
5		PMMC mechanism,
6		DC Voltmeter,
7		Ammeter sensitivity,
8		series and shunt type ohm meter
9		multimeter or VOM. True RMS voltmeter Digital voltmeter
10		Rectifier - amplifier and amplifier - Rectifier type.
11	Unit II:	DC and AC Bridges,
12	Bridges &	Wheat stone Bridge,
13	Transducers	Kelvin Bridge,
14		Maxwell Hay
15		Schering, Wien Bridges,
16		Cathode ray oscilloscope,
17		Block diagram, Basic operation,
18		Transducers and their classification,
19		strain gauge and displacement transducer.
20	Unit III:	Definition of AM and Detection of AM,
21	Amplitude	Modulation index,
22	Modulation	power in AM wave,
23	and Demodulation	linear and square law modulation technique,
24		5 Numerical problems.
25		Definition of Amplitude Demodulation
26		Generation and detection of amplitude demodulation,
27		linear diode detection,
28		choice of RC, Numerical problems
29	Unit	Definition of frequency modulation,
30	Frequency	modulation index,
31	Modulation	frequency spectrum of frequency,
32	and Demodulation	frequency modulation wave,
33		direct and indirect method of FM,
34		Pre-emphasis and de-emphasis
35		Frequency demodulation: Foster seeley and phase locked loop.
36		Numerical problem related to FM demodulation.
37	Unit V:	Pulse code modulation (PCM),
38	Digital Modulation	Amplitude Shift Keying (ASK),
39		Frequency Shift Keying (FSK),
40		Phase Shift Keying (PSK)

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Electronics

Lesson Plan - B. Sc. (IT+ELEX,PHY+ELEX)VI (Jan 2017 -May 2017)

Subject - PRACTICALS

Teacher - Dr.Pradeep Purey/Prof. Richa Joshi

Day/Lecture	Topic
1	Study of AM Modulation.
2	Study of Demodulation.
3	Study of FM Modulation.
4	Study of FM Demodulation.
5	Study of PCM Modulation.
6	Study of PCM Demodulation.
7	Study of CRO(Block Diagram of Internal Circuit of CRO, Measurement of Phase Difference between two waveforms , Frequency , Average DC and Peak Voltage Measurements for Sine, Triangular and Square Waves).
8	Study of Kelvin Bridge.
9	Study of Maxwell Bridge.
10	Study of Wien Bridge.