-

Table of Contents

Note : Remove “Table of Content” before including in CP Book
Each Course Plan shall be printed and made into a book with cover page
Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

18ELN14 : Basic Electronics

A. COURSE INFORMATION

1. Course Overview

Degree:	BE	Program:	EC
Year / Semester :	2019/1	Academic Year:	2019-20
Course Title:	BASIC ELECTRONICS	Course Code:	18ELN14
Credit / L-T-P:	40-14-0	SEE Duration:	180 Minutes
Total Contact Hours:	54	SEE Marks:	100 Marks
CIA Marks:	30 Marks	Assignment	1/ Module
Course Plan Author:	TEJASWINI.M/ N.S.MYTHREYE/ M NAGARAJA	Sign	
Reviewed By:		Sign	

2. Course Content

Module	Module Content	Teaching Hours	Module Concepts	Blooms Level
1	Semiconductor Diodes and Applications: P-N junction diode, Equivalent circuit of diode, Zener diode and zener diode as a regulator. Rectification-Half wave rectifier, full wave rectifier, bridge rectifier, capacitor filter circuit, Photo diode, LED, Photo coupler, 78XX series and 7805 fixed IC voltage regulator	11	Regulator Rectifiers	L2,L3
2	FET and SCR: Introduction to JFET, construction and operation, JFET drain characteristics and parameters, JFET transfer characteristics, Square law expression ID , Input resistance, MOSFET: Depletion and enhancement type construction, operation, characteristics and symbols. CMOS, Silicon Controlled Rectifier- two transistor model, Switching action characteristics and phase control application	14	FET and SCR characteristics	L3,L3
3	Operational Amplifiers and Applications: Introduction to op-amp, Op-amp input modes, Op-amp parameters-CMRR, Input offset voltage and current, Input bias current, Input and output impedance , Slew rate. Applications of op-amp- Inverting amplifier, Non-inverting amplifier, Summer, voltage follower, integrator, differentiator, comparator	9	Op-amp Characteristics and virtual ground	L3,L3
4	BJT applications. Feedback amplifiers and oscillators: BJT as an amplifier, as a switch, Transistor switch circuit to switch ON/OFF an LED and a lamp in a power circuit using relay. Feedback amplifiers-Principle, properties and advantages of negative feedback, Types of feedback, Voltage series feedback and gain stability with feedback, Oscillators- Barkhaunsen's criteria for oscillation, RC phase shift oscillator, Wein bridge oscillator, IC 555 timer and astable oscillator using IC 555	12	BJT characteristics and Oscillators	L3,L3
5	Digital Electronics Fundamentals: Difference between analog and digital signals, Number systems: Binary and hexadecimal, Conversion: Decimal to binary and hexadecimal to decimal and vice-versa, Boolean algebra, Basic and universal gates, Half and full adder, Multiplexer, decoder, SR and JK flip flops, Shift register, 3 bit Ripple counter. Basic communication system, Principle of operations of Mobile phone	8	Counters and Mobile Communication	L3,L2

3. Course Material

Module	Details	Available
1	Text books	
1	D P Kothari, I J Nagarath, "Basic Electronics", 2nd edn, Mc Graw Hill, 2018	Not Available
2	D P Kothari, I J Nagarath, "Basic Electronics", 2nd edn, Mc Graw Hill, 2018	Not Available
2	Thomas.L.Floyd, "Electronic Devices", Pearson education, 9th edition, 2012	In Lib
3	D P Kothari, I J Nagarath, "Basic Electronics", 2nd edn, Mc Graw Hill, 2018	Not Available
3	Thomas.L.Floyd, "Electronic Devices", Pearson education, 9th edition, 2012	In Lib
4	D P Kothari, I J Nagarath, "Basic Electronics", 2nd edn, Mc Graw Hill, 2018	Not Available
4	Thomas.L.Floyd, "Electronic Devices", Pearson education, 9th edition, 2012	In Lib
5	D P Kothari, I J Nagarath, "Basic Electronics", 2nd edn, Mc Graw Hill, 2018	Not Available
2	Reference books	
1	D P Kothari, I J Nagarath, "Basic Electronics", 1st edn, Mc Graw Hill, 2014	In Lib
2	Boylestad, Nashelskey,"Electronic Devices and Circuit theory", Pearson Education, 9th edition, 2007/11th edition, 2013	In Lib
3	David A Bell, "Electronic Devices And Circuits", Oxford University Press, 5th Edition, 2008	In Lib
4	Muhammad H Rashid, "Electronics Devices and Circuits", Cengage Learning, 2014.	In Lib
3	Others (Web, Video, Simulation, Notes etc.)	
		Not Available

4. Course Prerequisites

SNo	Course Code	Course Name	Module / Topic / Description	Sem	Remarks	Blooms Level
1					Diodes and transistors	
2					Number theory	

Note: If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

B. OBE PARAMETERS

1. Course Outcomes

#	COs	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
18ELN24.1	Describe the operations of diodes as regulators.	5	Regulator	Lecture	Assignment	L2
18ELN24.2	Explain the construction of rectifiers and filters	6	Rectifiers	Lecture	Assignment	L3

18ELN24.3	Have knowledge of FET characteristics	8	Field Effect Transistors characteristics	Lecture	Assignment	L3
18ELN24.4	Understand and apply the general operating principle of SCR	6	Silicon Controlled Rectifier characteristics	Lecture	Assignment	L3
18ELN24.5	Implement the working of operational amplifiers	4	Op-amp Characteristics	Lecture	Assignment	L3
18ELN24.6	Extend the op-amp as adder, differentiator, integrator, comparator and voltage regulator	5	Virtual Ground	Lecture	Assignment	L3
18ELN24.7	Describe the operation of BJT	6	Bipolar Junction Transistors characteristics	Lecture	Assignment	L3
18ELN24.8	Examine the amplifiers and oscillators	6	Oscillators	Lecture	Assignment	L3
18ELN24.9	Apply different number systems for conversions and construct simple combinational and sequential circuits using FLip-Flops	6	Counters	Lecture	Slip test/ Assignment	L3
18ELN24.10	Describe the basic principle of operation of communication system and mobile phones.	2	Mobile Communication	Lecture	Slip test/ Assignment	L2
-	**Total**	**54**	-	-	-	-

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

2. Course Applications

SNo	Application Area	CO	Level
1	Maintain constant voltage level to regulate one or more AC or DC voltages in PCB's	CO1	L2
2	Processing the signal to remove unwanted frequency components and to enhance wanted ones in power supply instruments	CO2	L3
3	Used as input amplifiers in oscilloscopes, electronic voltmeters and other measuring and testing equipment using their high input impedance, in electronically controlled switches	CO3	L3
4	Used in devices where control of high power is demanded such as lamp dimming, power regulators and motor control and in home appliances including lighting, temperature control, fan speed regulation, heating and alarm activation	CO4	L3
5	Used as voltage follower, selective inversion circuit, current to voltage converter, active rectifier, integrator, filter and comparator in medical cardiographs	CO5	L3

6	Analog computers, analog to digital converters and wave-shaping circuits	CO6	L3
7	Used as automatically controlled switches, TTL circuits, amplifiers, current drivers	CO7	L3
8	Applied in Tunable radio transmitters and receivers, signal generators	CO8	L3
9	Temporary data storage, data transfer. Data manipulation, counters	CO9	L3
10	Mobile phones	CO10	L2

Note: Write 1 or 2 applications per CO.

3. Articulation Matrix

(CO – PO MAPPING)

-	Course Outcomes	Program Outcomes												
#	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Level
18ELN24.1	Describe the operations of diodes as regulators.	3	3	-	-	-	-	-	-	-	-	-	1	L2
18ELN24.2	Explain the construction of rectifiers and filters	3	3	-	-	-	-	-	-	-	-	-	-	L3
18ELN24.3	Have knowledge of FET characteristics	3	3	-	-	-	-	-	-	-	-	-	-	L3
18ELN24.4	Understand and apply the general operating principle of SCR	3	3	-	2	-	-	-	-	-	-	-	-	L3
18ELN24.5	Implement the working of operational amplifiers	3	-	-	-	-	-	-	-	-	-	-	-	L3
18ELN24.6	Extend the op-amp as adder, differentiator, integrator, comparator and voltage regulator	3	3	-	-	-	-	-	-	-	-	-	-	L3
18ELN24.7	Describe the operation of BJT	3	3	-	-	-	-	-	-	-	-	-	-	L3
18ELN24.8	Examine the amplifiers and oscillators	3	3	-	-	-	-	-	-	-	-	-	-	L3
18ELN24.9	Apply different number systems for conversions and construct simple combinational and sequential circuits using FLip-Flops	3	3	-	-	-	-	-	-	-	-	-	1	L3
18ELN24.10	Describe the basic principle of operation of communication system and mobile phones.	3	3	-	-	-	-	-	-	-	-	-	1	L2
Note: Mention the mapping strength as 1, 2, or 3														

4. Mapping Justification

Mapping		Justification	Mapping Level
CO	**PO**	**-**	**-**
CO1	PO1	Knowledge of diode working,current flowing through diodes is required.	L2
CO1	PO2	Problem analysis of diodes	L2
CO1	PO12	Life long learning of diode regulators	L2
CO2	PO1	Working of Half wave rectifiers FWR	L3
CO2	PO2	Numerical related to HWR and FWR	L3
CO3	PO1	Have Knowledge of FET Characteristics	L3

CO3	PO2	JFET,MOSFET	L3
CO4	PO1	Working of SCR principle is known to build complex circuits	L3
CO4	PO2	Analyzing of square law for SCR	L3
CO4	PO4	Analysis of Switching Characteristics	L3
CO5	PO1	Opamp block diagram, understanding the parameters of opamp	L3
CO6	PO1	Applying the knowledge of virtual ground for deriving gain for integrator and differentiator	L3
CO6	PO2	Analyzing comparator and voltage regulator circuit	L3
CO7	PO1	Working of BJT principle is known to build complex circuits	L3
CO7	PO2	Analyzing transistor as a switch and application in relays	L3
CO8	PO1	Working of Oscillators principle is known to build complex circuits	L3
CO8	PO2	Analyzing wein bridge oscillators	L3
CO9	PO1	Knowledge of number systems for solving complex problems	L3
CO9	PO2	Analyzing problem in SR flip flop	L3
CO9	PO12	Designing of a Memory elements in microprocessor	L3
CO10	PO1	Block diagram of a communication system	L2
CO10	PO2	Mobile phones analysis for proper communication	L2
CO10	PO12	Upgrading of communication systems	L2

Note: Write justification for each CO-PO mapping.

5. Curricular Gap and Content

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1	Diodes and Transistors				
2	Number theory				
3					
4					
5					

Note: Write Gap topics from A.4 and add others also.

6. Content Beyond Syllabus

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1	Octal Number system				
2					
3					
4					
5					

Note: Anything not covered above is included here.

C. COURSE ASSESSMENT

1. Course Coverage

Module #	Title	Teaching Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Semiconductor diodes and applications	11	2	-	-	1	1	2	CO1, CO2	L2,L3
2	FET and SCR	14	2	-	-	1	1	2	CO3, CO4	L3,L3

3	Operational amplifiers and applications	9	-	2	-	1	1	2	CO5, CO6	L3,L3
4	BJT applications, Feedback amplifiers and oscillators	12	-	2	-	1	1	2	CO7, C08	L3,L3
5	Digital Electronics Fundamentals	8	-	-	4	1	1	2	CO9, CO10	L3,L2
-		**54**	**4**	**4**	**4**	**5**	**5**	**10**	**-**	**-**

Note: Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

2. Continuous Internal Assessment (CIA)

Evaluation	Weightage in Marks	CO	Levels
CIA Exam – 1	30	CO1, CO2, CO3, CO4	L2, L3, L3, L3
CIA Exam – 2	30	CO5, CO6, CO7, C08	L3, L3, L3, L3
CIA Exam – 3	30	CO9, CO10	L3, L4
Assignment - 1	10	CO1, CO2, CO3, CO4	L2, L3, L3, L3
Assignment - 2	10	CO5, CO6, CO7, C08	L3, L3, L3, L3
Assignment - 3	10	CO9, CO10	L3, L2
Seminar - 1		CO1, CO2, CO3, CO4	L2, L3, L3, L3
Seminar - 2		CO5, CO6,CO7,CO8	L3, L3, L3, L3
Seminar - 3		CO9, CO10	L3, L2
Other Activities – mini-project		CO1 to CO10	L2, L3, L3, L3, L3, L3, L3, L3,L3, L2
Final CIA Marks	**40**	**-**	

Note : Blooms Level in last column shall match with A.2 above.

D1. TEACHING PLAN - 1

Module - 1

Title:	Semiconductor diodes and applications	Appr Time:	11 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Describe the operations of diodes as regulators.	CO1	L2
2	Explain the construction of rectifiers and filters	CO2	L3
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
1	p-n junction diode, Equivalent circuit of diode,	CO1	L2
2	Zener Diode, Zener diode as a voltage regulator,	CO1	L2
3	Rectification-Half wave rectifier, Full wave rectifier,	CO2	L3
4	Bridge rectifier	CO2	L3
5	Capacitor filter circuit	CO2	L2
6	photodiode	CO2	L2
7	LED	CO2	L2
8	Photocoupler	CO2	L2
9	78XX series abd 7805 Fixed IC voltage regulator.	CO2	L2
10	Numericals on diodes	CO1	L3
11	Numericals on rectifiers	CO2	L3
c	**Application Areas**	**CO**	**Level**
1	Maintain constant voltage level to regulate one or more AC or DC voltages	CO1	L3

	in PCB's		
2	Processing the signal to remove unwanted frequency components and to enhance wanted ones in power supply instruments	CO2	L3
d	**Review Questions**	-	-
1	Explain the theory of PN junction	CO1	L2
2	With neat sketch explain the formation of depletion region in unbiased pn junction	CO1	L2
3	Explain the different types of diode approximations	CO1	L2
4	Draw and explain VI characteristics of PN junction diode	CO1	L2
5	What is rectifier? Draw the circuit for HWR and explain its working? Derive the expression for I_{DC} efficiency η PIV, RMS value of voltage	CO1	L2
6	Draw the circuit for FWR and explain its working? Derive the expression for I_{DC} efficiency η PIV, RMS value of voltage	CO2	L2
7	Define ripple factor? Show that for HWR ripple factor is 1.21	CO2	L2
8	Explain the avalanche and zener break down with the help of VI characteristics?	CO2	L2
9	Draw the bridge rectifier circuit and explain its operation with waveforms. Show that ripple factor is 0.48?	CO2	L2
10	With relevant waveforms derive expression for I_{DC}, I_{RMS} and riipple factor of a FWR?	CO2	L2
11	Explain how a zener diode can be used as voltage regulator? Also explain its performance?	CO1	L2
12	What is 78XX series? Explain the 7805 fixed IC voltage regulator?	CO2	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

Module – 2

Title:	FET and SCR	Appr Time:	14 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Have knowledge of FET characteristics	CO3	L3
2	Understand and apply the general operating principle of SCR	CO4	L3
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
12	JFET construction and operation	CO3	L2
13	JFET drain characteristics and parameters	CO3	L2
14	JFET transfer characteristics	CO3	L2
15	Square law expression I_D, Input resistance	CO3	L2
16	MOSFET: Depletion and enhancement type construction	CO3	L2
17	MOSFET: operation, characteristics and symbols	CO3	L2
18	CMOS	CO4	L2
19	Silicon Controlled Rectifier- two transistor model	CO4	L2
20	Switching action characteristics	CO4	L2
21	Phase control application	CO4	L2
22	Numericals on JFET	CO3	L3

23	Numericals on square law	CO3	L3
24	Numericals on MOSFET	CO3	L3
25	Numericals on SCR	CO4	L3
c	**Application Areas**	**CO**	**Level**
1	Used as input amplifiers in oscilloscopes, electronic voltmeters and other measuring and testing equipment using their high input impedance, in electronically controlled switches	CO3	L3
2	Used in devices where control of high power is demanded such as lamp dimming, power regulators and motor control and in home appliances including lighting, temperature control, fan speed regulation, heating and alarm activation	CO4	L3
d	**Review Questions**	-	-
13	Explain the construction and operation of junction field effect transistor?	CO3	L3
14	Draw and explain the JFET drain characteristics and parameters	CO3	L3
15	Draw and explain JFET transfer characteristics	CO3	L3
16	Derive Square law expression I_D, and also find the Input resistance?	CO3	L3
17	Construct depletion and enhancement type MOSFET.	CO3	L3
18	Explain the operation, characteristics and symbols of MOSFET	CO3	L3
19	Write a short note on CMOS	CO3	L3
20	Define Silicon Controlled Rectifier. Draw the two transistor equivalent model and explain with its VI characteristics.	CO4	L3
21	Explain the Switching action characteristics of SCR	CO4	L3
22	Explain the Phase control application of SCR	CO4	L3
e	Experiances		

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	18ELN24	Sem:	I	Marks:	30	Time:	75 minutes		
Course:	Basic Electronics								
-	**-**	**Note: Answer any 1 question from each module**					**Marks**	**CO**	**Level**
		MODULE 1							
1	a	Explain the function of zener diode voltage regulator with neat circuit diagram and relevant equations for zener current					5	CO1	L2
	b	Explain the working of center tapped FWR and derive an expression for the following i) Average DC Voltage. ii) Rectification efficiency					5	CO2	L2
	c	Design and draw Zener regulator for the following specification V_o=5V V_{in}= 12 ± 3 V I_{Zmin}=10 mA I_L=20mA P_Z=500mW. Calculate R_{min} & R_{max}					5	CO1	L3
		OR							
2	a	Explain briefly capacitor filter circuit.					5	CO2	L2
	b	Explain the functioning of the following: I) photo diode ii) LED iii) photo coupler					5	CO2	L2
	c	Define 78xx series and explain the 7805 fixed IC voltage regu/lator?					5	CO2	L2
		MODULE 2							
3	a	Draw the drain characteristics of n-channel JFET and explain it?					5	CO3	L2
	b	Derive Square law expression I_D, and also find the Input resistance?					5	CO3	L3

	c	Draw the two transistor equivalent circuit of SCR . Also plot VI characteristics and explain various regions of operation	5	CO4	L2
4	a	Construct depletion and enhancement type MOSFET.	5	CO3	L3
	b	Explain the operation, characteristics and symbols of MOSFET	5	CO3	L3
	c	Draw the two transistor equivalent circuit of SCR . Also plot VI characteristics and explain various regions of operation	5	CO4	L2

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions

Crs Code:	18ELN24	Sem:	I	Marks:	10	Time:	90 – 120 minutes
Course:	Basic Electronics						

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

SNo	USN	Assignment Description	Marks	CO	Level
1		Design and draw Zener regulator for the following specification V_o=5V V_{in}= 12 ± 3 V I_{Zmin}=10 mA I_L=20mA P_Z=500mW. Calculate R_{min} & R_{max}	5	CO1	L3
2		Explain the working of center tapped FWR and derive an expression for the following i) Average DC Voltage. ii) Rectification efficiency	5	CO2	L2
3		What is voltage regulator? Why it is necessary? Explain how zener diode can be used as voltage Regulator.	5	CO1	L2
4		Calculate the output DC voltage and efficiency for the bridge rectifier given load resistance= 100Ω and diode forward resistance = 10Ω and AC inout voltage = 300 sint wt.	5	CO2	L3
5		Explain the operation of Zener voltage regulator with load.	5	CO1	L2
6		Explain the working of Half Wave Rectifier and derive the expression for the following i) Average DC Voltage.ii) Rectification efficiency	5	CO2	L2
7		Draw the circuit of FWR and show that ripple factor is equal to 0.48 and efficiency is 81%	5	CO2	L3
8		With neat circuit diagram and waveform explain the working of full wave bridge rectifier.	5	CO2	L2
9		Explain briefly capacitor filter circuit.	5	CO2	L2
10		With a neat circuit diagram and waveforms, explain the working of a half wave rectifier.	5	CO2	L2
11		Write a note on voltage regulator circuit.	5	CO1	L2
12		Explain the function of zener diode voltage regulator with neat circuit diagram and relevant equations for zener current	5	CO1	L2
13		Prove that ripple factor of HWR rectifier is 1.21	5	CO2	L3
14		Define line regulation and load regulator	5	CO1	L2
15		Discuss the performance of zener diode in terms of source and load effects	5	CO1	L2
16		Explain the functioning of the following: I) photo diode ii) LED iii) photo coupler	5	CO2	L2
17		Define 78xx series and explain the 7805 fixed IC voltage regu/lator?	5	CO2	L2
18		Draw the drain characteristics of n-channel JFET and explain	5	CO3	L2

		it?			
19		Draw the two transistor equivalent circuit of SCR . Also plot VI characteristics and explain various regions of operation	5	CO4	L2
20		What are the applications of SCR. Explain	5	CO4	L2
21		Draw the circuit diagram to show how an SCR can be triggered by application of a pulse to the gate terminal. Sketch the circuit waveforms and explain its operation?	5	CO4	L2
22		Sketch typical SCR forward and reverse characteristics. Identify all regions of characteristics and all important current and voltage level?	5	CO4	L2
23		Draw the drain characteristics of p-channel JFET and explain it?	5	CO3	L2
24		Explain the construction and operation of junction field effect transistor?	5	CO3	L3
25		Draw and explain the JFET drain characteristics and parameters	5	CO3	L3
26		Draw and explain JFET transfer characteristics	5	CO3	L3
27		Derive Square law expression I_D, and also find the Input resistance?	5	CO3	L3
28		Construct depletion and enhancement type MOSFET.	5	CO3	L3
29		Explain the operation, characteristics and symbols of MOSFET	5	CO3	L3
30		Write a short note on CMOS	5	CO3	L3
31		Define Silicon Controlled Rectifier. Draw the two transistor equivalent model and explain with its VI characteristics.	5	CO4	L3
32		Explain the Switching action characteristics of SCR	5	CO4	L3
33		Explain the Phase control application of SCR	5	CO4	L3
34		Design and draw Zener regulator for the following specification V_o=5V V_{in}= 12 – 3 V I_{Zmin}=10 mA I_L=20mA P_Z=500mW. Calculate R_{min} & R_{max}	5	CO1	L3
35		Explain the working of center tapped FWR and derive an expression for the following i) Average DC Voltage. ii) Rectification efficiency	5	CO2	L2
36		What is voltage regulator? Why it is necessary? Explain how zener diode can be used as voltage Regulator.	5	CO1	L2
37		Calculate the output DC voltage and efficiency for the bridge rectifier given load resistance= 100Ω and diode forward resistance = 10Ω and AC inout voltage = 300 sint wt.	5	CO2	L3
38		Explain the operation of Zener voltage regulator with load.	5	CO1	L2
39		Explain the working of Half Wave Rectifier and derive the expression for the following i) Average DC Voltage.ii) Rectification efficiency	5	CO2	L2
40		Draw the circuit of FWR and show that ripple factor is equal to 0.48 and efficiency is 81%	5	CO2	L3
41		With neat circuit diagram and waveform explain the working of full wave bridge rectifier.	5	CO2	L2
42		Explain briefly capacitor filter circuit.	5	CO2	L2
43		With a neat circuit diagram and waveforms, explain the working of a half wave rectifier.	5	CO2	L2
44		Write a note on voltage regulator circuit.	5	CO1	L2

45		Explain the function of zener diode voltage regulator with neat circuit diagram and relevant equations for zener current	5	CO1	L2
46		Prove that ripple factor of HWR rectifier is 1.21	5	CO2	L3
47		Define line regulation and load regulator	5	CO1	L2
48		Discuss the performance of zener diode in terms of source and load effects	5	CO1	L2
49		Explain the functioning of the following: I) photo diode ii) LED iii) photo coupler	5	CO2	L2
50		Define 78xx series and explain the 7805 fixed IC voltage regu/lator?	5	CO2	L2
51		Draw the drain characteristics of n-channel JFET and explain it?	5	CO3	L2
52		Draw the two transistor equivalent circuit of SCR . Also plot VI characteristics and explain various regions of operation	5	CO4	L2
53		What are the applications of SCR. Explain	5	CO4	L2
54		Draw the circuit diagram to show how an SCR can be triggered by application of a pulse to the gate terminal. Sketch the circuit waveforms and explain its operation?	5	CO4	L2
55		Sketch typical SCR forward and reverse characteristics. Identify all regions of characteristics and all important current and voltage level?	5	CO4	L2
56		Draw the drain characteristics of p-channel JFET and explain it?	5	CO3	L2
57		Explain the construction and operation of junction field effect transistor?	5	CO3	L3
58		Draw and explain the JFET drain characteristics and parameters	5	CO3	L3
59		Draw and explain JFET transfer characteristics	5	CO3	L3
60		Derive Square law expression I_D, and also find the Input resistance?	5	CO3	L3
61		Construct depletion and enhancement type MOSFET.	5	CO3	L3
62		Explain the operation, characteristics and symbols of MOSFET	5	CO3	L3
63		Write a short note on CMOS	5	CO3	L3
64		Define Silicon Controlled Rectifier. Draw the two transistor equivalent model and explain with its VI characteristics.	5	CO4	L3
65		Explain the Switching action characteristics of SCR	5	CO4	L3
66		Explain the Phase control application of SCR	5	CO4	L3

D2. TEACHING PLAN - 2

Module – 3

Title:	Operational Amplifiers and Applications	Appr Time:	9 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Implement the working of operational amplifiers	CO5	L2
2	Extend the op-amp as adder, differentiator, integrator, comparator and voltage follower	CO6	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**

26	Introduction to op-amp, Op-amp input modes.	CO5	L2
27	Op-amp parameters-CMRR, Input offset voltage and current.	CO5	L2
28	Op-amp parameters- Input bias current, Input and output impedance , Slew rate	CO5	L2
29	Inverting amplifier	CO6	L3
30	Non-inverting amplifier	CO6	L3
31	Summer	CO6	L3
32	Voltage follower	CO6	L3
33	Integrator, differentiator.	CO6	L3
34	Comparator.	CO6	L3
c	**Application Areas**	**CO**	**Level**
1	Used as voltage follower, selective inversion circuit, current to voltage converter, active rectifier, integrator, filter and comparator in medical cardiographs	CO5	L3
2	Analog computers, analog to digital converters and wave-shaping circuits	CO6	L3
d	**Review Questions**	-	-
21	What is operational amplifier? Explain the equivalent circuite of op-amp.	CO5	L2
22	List the ideal and practical characteristics of op-amp.	CO5	L2
23	Explain inverting and Non-inverting mode of op-amp.	CO5	L2
24	Distinguish between open loop and closed loop configuration of op-amp.	CO5	L2
25	What is voltage follower w.r.t op-amp? Explain the circuit of voltage follower.	CO6	L2
26	What is op-amp summer circuit? Explain the op-amp based summer circuit with derivation to output voltage?	CO6	L2
27	Explain op-amp based subtractor circuit and derive an expression for output voltage.	CO6	L2
28	Show how op-amp can be used as integrator and derive an expression for output voltage.	CO6	L2
29	Explain the op-amp based differentiator circuit and derive an expression for output voltage.	CO6	L2
30	Explain how op-amp can be used as comparator.	CO6	L2
e	**Experiences**		
1			
2			
3			
4			
5			

Module – 4

Title:	BJT Applications, Feedback Amplifiers and Oscillators	Appr Time:	16 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Describe the operation of BJT	CO7	L3
2	Examine the amplifiers and oscillators	CO8	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
35	BJT as an amplifier	CO7	L2

36	BJT as a switch	CO7	L2
37	Transistor switch circuit to switch ON/OFF an LED and a lamp in a power circuit using relay	CO7	L2
38	Feedback amplifiers-Principle, properties and advantages of negative feedback	CO8	L2
39	Types of feedback, Voltage series feedback and gain stability with feedback	CO8	L2
40	Oscillators- Barkhaunsen's criteria for oscillation	CO8	L2
41	RC phase shift oscillator	CO8	L2
42	Wein bridge oscillator	CO8	L2
43	IC 555 timer and astable oscillator using IC 555	CO8	L2
44	Numericals on transistors	CO7	L3
45	Numericals on amplifiers	CO8	L3
46	Numericals on oscillators	CO8	L3
c	**Application Areas**	**CO**	**Level**
1	Used as automatically controlled switches, TTL circuits, amplifiers, current drivers	CO8	L3
2	Applied in Tunable radio transmitters and receivers, signal generators	CO7	L3
d	**Review Questions**	-	-
1	Explain BJT as an amplifier?	CO7	L2
2	Explain BJT as a switch?	CO7	L2
3	Explain Transistor switch circuit to switch ON/OFF an LED	CO7	L2
4	Describe the lamp in a power circuit using relay?	CO7	L2
5	Explain the principle of feed back amplifeirs?	CO8	L2
6	List the types of feedback. Explain the properties and advantages of negative feedback.	CO8	L2
7	Explain the Voltage series feedback	CO8	L2
8	Describe the gain stability with feedback	CO8	L2
9	Explain the Barkhaunsen's criteria for oscillation	CO8	L2
10	Explain the working of RC phase shift oscillator	CO8	L2
11	Explain the working of Wein bridge oscillator	CO8	L2
12	Draw the pin diagram of the IC 555 timer and explain astable oscillator using IC 555	CO8	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	18ELN24	Sem:	I	Marks:	30	Time:	75 minutes		
Course:	Basic Electronics								
-	**-**	**Note: Answer any 2 questions, each carry equal marks.**					**Marks**	**CO**	**Level**
		MODULE-3							
1	a	What is operational amplifier? Explain the equivalent circuit of op-amp.					5	CO5	L2
	b	Show how op-amp can be used as integrator and derive an expression for output voltage.					5	CO6	L2
	c	Calculate the output voltage of a three input summing amplifier given					5	CO6	L3

		R_1=200kΩ, R_2 = 250KΩ, R_3 = 500kΩ and R_f = 1MΩ. V_1= -2v, V_2=2 v, V_3=1v			
		OR			
2	a	Explain the op-amp based differentiator circuit and derive an expression for output voltage.	5	CO6	L2
	b	Explain how op-amp can be used as comparator.	5	CO6	L2
	c	Design an adder circuit using op amp to obtain an output voltage of V_o=2[0.1V_1+0.5V_2+2V_3] where V_1, V_2 and V_3 are input voltages.	5	CO6	L3
		MODULE-4			
3	a	Explain BJT as an amplifier?	5	CO7	L2
	b	Explain Transistor switch circuit to switch ON/OFF an LED	5	CO7	L2
	c	Explain the principle of feed back amplifiers?	5	CO8	L2
		OR			
4	a	Explain BJT as a switch?	5	CO7	L2
	b	Explain the Barkhaunsen's criteria for oscillation	5	CO8	L2
	c	Draw the pin diagram of the IC 555 timer and explain astable oscillator using IC 555	5	CO8	L2

b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18ELN24	Sem:	I	Marks:	10	Time:	90 – 120 minutes
Course:	Basic Electronics						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		What is operational amplifier? Explain the equivalent circuit of op-amp.	5	CO5	L2
2		List the ideal and practical characteristics of op-amp.	5	CO5	L2
3		Explain inverting and Non-inverting mode of op-amp.	5	CO5	L2
4		Distinguish between open loop and closed loop configuration of op-amp.	5	CO5	L2
5		What is voltage follower w.r.t op-amp? Explain the circuit of voltage follower.	5	CO6	L2
6		What is op-amp summer circuit? Explain the op-amp based summer circuit with derivation to output voltage?	5	CO6	L2
7		Explain op-amp based subtractor circuit and derive an expression for output voltage.	5	CO6	L2
8		Show how op-amp can be used as integrator and derive an expression for output voltage.	5	CO6	L2
9		Explain the op-amp based differentiator circuit and derive an expression for output voltage.	5	CO6	L2
10		Explain how op-amp can be used as comparator.	5	CO6	L2
11		Design an adder circuit using op amp to obtain an output voltage of V_o=2[0.1V_1+0.5V_2+2V_3] whwre V_1, V_2 and V_3 are input voltages.	5	CO6	L3
12		What is an op-amp. Explain the ideal characteristics of the op-amp?	5	CO6	L2
13		Define the following in case of a practical op-amp i) Slew rate ii) CMRR iii) Off set voltages iv) PSRR	5	CO6	L2
14		Calculate the output voltage of a three input summing amplifier given R_1=200kΩ, R_2 = 250KΩ, R_3 = 500kΩ and R_f = 1MΩ. V_1= -2v, V_2=2 v, V_3=1v	5	CO6	L3
15		Write any four advantages of negative feedback amplifiers?	5	CO7	L2
16		What is operational amplifier? Explain the equivalent circuit of op-amp.	5	CO5	L2

17		List the ideal and practical characteristics of op-amp.	5	CO5	L2
18		Explain inverting and Non-inverting mode of op-amp.	5	CO5	L2
19		Distinguish between open loop and closed loop configuration of op-amp.	5	CO5	L2
20		What is voltage follower w.r.t op-amp? Explain the circuit of voltage follower.	5	CO6	L2
21		What is op-amp summer circuit? Explain the op-amp based summer circuit with derivation to output voltage?	5	CO6	L2
22		Explain op-amp based subtractor circuit and derive an expression for output voltage.	5	CO6	L2
23		Show how op-amp can be used as integrator and derive an expression for output voltage.	5	CO6	L2
24		Explain the op-amp based differentiator circuit and derive an expression for output voltage.	5	CO6	L2
25		Explain how op-amp can be used as comparator.	5	CO6	L2
26		Design an adder circuit using op amp to obtain an output voltage of $V_o=2[0.1V_1+0.5V_2+2V_3]$ whwre V_1, V_2 and V_3 are input voltages.	5	CO6	L3
27		What is an op-amp. Explain the ideal characteristics of the op-amp?	5	CO6	L2
28		Define the following in case of a practical op-amp i) Slew rate ii) CMRR iii) Off set voltages iv) PSRR	5	CO6	L2
29		Calculate the output voltage of a three input summing amplifier given R_1=200kΩ, R_2 = 250KΩ, R_3 = 500kΩ and R_f = 1MΩ. V_1= -2v, V_2=2 v, V_3=1v	5	CO6	L3
30		Write any four advantages of negative feedback amplifiers?	5	CO7	L2
31		Define the following in case of a practical op-amp i) Slew rate ii) CMRR iii) Off set voltages iv) PSRR	5	CO6	L2
32		Explain BJT as an amplifier?	5	CO7	L2
33		Explain BJT as a switch?	5	CO7	L2
34		Explain Transistor switch circuit to switch ON/OFF an LED	5	CO7	L2
35		Describe the lamp in a power circuit using relay?	5	CO7	L2
36		Explain the principle of feed back amplifeirs?	5	CO8	L2
37		List the types of feedback. Explain the properties and advantages of negative feedback.	5	CO8	L2
38		Explain the Voltage series feedback amplifier?	5	CO8	L2
39		Describe the gain stability with feedback?	5	CO8	L2
40		Explain the Barkhaunsen's criteria for oscillation	5	CO8	L2
41		Explain the working of RC phase shift oscillator?	5	CO8	L2
42		Explain the working of Wein bridge oscillator	5	CO8	L2
43		Draw the pin diagram of the IC 555 timer and explain astable oscillator using IC 555	5	CO8	L2
44		Explain BJT as an amplifier?	5	CO7	L2
45		Explain BJT as a switch?	5	CO7	L2
46		Explain Transistor switch circuit to switch ON/OFF an LED	5	CO7	L2
47		Describe the lamp in a power circuit using relay?	5	CO7	L2
48		Explain the principle of feed back amplifeirs?	5	CO8	L2
49		List the types of feedback. Explain the properties and advantages of negative feedback.	5	CO8	L2
50		Explain the Voltage series feedback amplifier?	5	CO8	L2
51		Describe the gain stability with feedback?	5	CO8	L2
52		Explain the Barkhaunsen's criteria for oscillation	5	CO8	L2
53		Explain the working of RC phase shift oscillator?	5	CO8	L2
54		Explain the working of Wein bridge oscillator	5	CO8	L2

55		Draw the pin diagram of the IC 555 timer and explain astable oscillator using IC 555	5	CO8	L2
56		Design an adder circuit using op amp to obtain an output voltage of $V_o=2[0.1V_1+0.5V_2+2V_3]$ whwre V_1, V_2 and V_3 are input voltages.	5	CO6	L3
57		What is an op-amp. Explain the ideal characteristics of the op-amp?	5	CO6	L2
58		Define the following in case of a practical op-amp i) Slew rate ii) CMRR iii) Off set voltages iv) PSRR	5	CO6	L2
59		Calculate the output voltage of a three input summing amplifier given R_1=200kΩ, R_2 = 250KΩ, R_3 = 500kΩ and R_f = 1MΩ. V_1= -2v, V_2=2 v, V_3=1v	5	CO6	L3
60		Explain the principle of feed back amplifeirs?	5	CO8	L2
61		List the types of feedback. Explain the properties and advantages of negative feedback.	5	CO8	L2
62		Explain the Voltage series feedback amplifier?	5	CO8	L2
63		Describe the gain stability with feedback?	5	CO8	L2
64		Explain the Barkhaunsen's criteria for oscillation	5	CO8	L2
65		Explain the working of RC phase shift oscillator?	5	CO8	L2
66		Explain the working of Wein bridge oscillator	5	CO8	L2

D3. TEACHING PLAN - 3

Module – 5

Title:	Digital Electronics Fundamentals	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Apply different number systems for conversions and construct simple combinational and sequential circuits using FLip-Flops	CO9	L3
2	Describe the basic principle of operation of communication system and mobile phones.	CO10	L2
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
47	Difference between analog and digital signals	CO9	L3
48	Number systems: Binary and hexadecimal	CO9	L3
49	Conversion: Decimal to binary and hexadecimal to decimal and vice-versa	CO9	L3
50	Boolean algebra, Basic and universal gates	CO9	L3
51	Half and full adder	CO9	L3
52	Multiplexer, decoder, SR and JK flip flops	CO9	L3
53	Shift register, 3 bit Ripple counter.	CO9	L3
54	Basic communication system, Principle of operations of Mobile phone	CO10	L2
c	**Application Areas**	**CO**	**Level**
1	Temporary data storage, data transfer. Data manipulation, counters	CO9	L3
2	Mobile phones	CO10	L2
d	**Review Questions**	-	-
1	Differentiate between analog and digital signals	CO9	L3
2	Explain the Binary and hexadecimal forms of numbers	CO9	L3
3	Explain conversion process of Decimal to binary and hexadecimal to decimal and vice-versa	CO9	L3
4	State and prove De-Morgan's Theorem	CO9	L3

5	Explain the basic laws in boolean algebra	CO9	L3
6	With truth table explain Basic and universal gates	CO9	L3
7	Realize Half and full adder sing basic and universal gates	CO9	L3
8	Explain the working of the following: I) Multiplexer ii) decoder iii) SR flip flop iv) JK flip flop	CO9	L3
9	Explain the following: I) Shift register ii) 3 bit Ripple counter.	CO9	L3
10	With a neat block diagram explain the communication system?	CO10	L2
11	Explain the Principle of operations of Mobile phone	CO10	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	CS501PC	Sem:	I	Marks:	30	Time:	75 minutes
Course:	Design and Analysis of Algorithms						

-	-	**Note: Answer any 2 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
		MODULE-5			
1	a	Solve the following (i) $(ABC)_{16}=(?)_2$ (ii) $(985.85)_{10}=(?)_8$	5	CO9	L3
	b	Reduce the following Boolean expression and implement using basic gates. F=ABC+ABC+ABC+ABC	5	CO9	L3
	c	Explain the working of the following: I) Multiplexer ii) decoder iii) SR flip flop iv) JK flip flop	5	CO9	L3
		OR			
2	a	Realize Half and full adder sing basic and universal gates	5	CO9	L3
	b	Design a logic circuit using basic gates with three inputs A, B, C and output Y that goes low only when A is high and B and C are different	5	CO9	L3
	c	Explain the Principle of operations of Mobile phone	5	CO10	L2
		MODULE-5			
3	a	Explain the following: I) Shift register ii) 3 bit Ripple counter.	5	CO9	L3
	b	Simplify ABC+A B C+AB C + A BC	5	CO9	L3
	c	Perform the following conversions: I) $(ABCD.EF)_H=(?)_8$ ii) $(988.86)_{10}=(?)_2$	5	CO9	L3
		OR			
4	a	Write the decimal equivalent of $(10AB)_{16}$	5	CO9	L3
	b	Convert $(ABCD)_{16}=(?)_2=(?)_8=(?)_{10}$	5	CO9	L3
	c	With a neat block diagram explain the communication system?	5	CO10	L2

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	15ELN14	Sem:	I	Marks:	10	Time:	90 – 120 minutes
Course:	Basic Electronics						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		Solve the following (i) $(1024.625)_{10}=(?)_2$ (ii) $(2651.53)_8=(?)_2$	5	CO9	L3
2		Solve the following (i) $(ABC)_{16}=(?)_2$ (ii) $(985.85)_{10}=(?)_8$	5	CO9	L3
3		Reduce the following Boolean expression and implement	5	CO9	L3

		using basic gates. F=ABC+ABC+ABC+ABC			
4		Differentiate between analog and digital signals	5	CO9	L3
5		Explain the Binary and hexadecimal forms of numbers	5	CO9	L3
6		Explain conversion process of Decimal to binary and hexadecimal to decimal and vice-versa	5	CO9	L3
7		State and prove De-Morgan's Theorem	5	CO9	L3
8		Explain the basic laws in boolean algebra	5	CO9	L3
9		With truth table explain Basic and universal gates	5	CO9	L3
10		Realize Half and full adder sing basic and universal gates	5	CO9	L3
11		Explain the working of the following: I) Multiplexer ii) decoder iii) SR flip flop iv) JK flip flop	5	CO9	L3
12		Explain the following: I) Shift register ii) 3 bit Ripple counter.	5	CO9	L3
13		With a neat block diagram explain the communication system?	5	CO10	L2
14		Explain the Principle of operations of Mobile phone	5	CO10	L2
15		Draw the logic circuit for full adder and write the truth table with expression using NOR gate.	5	CO9	L3
16		Implement full adder using two half adders and one OR gate. Write the equations for sum and carry.	5	CO9	L3
17		Simplify P=xy+xyz+xyz+$x\bar{y}\bar{z}$ using 2 input NAND gates	5	CO9	L3
18		Perform the following: I) $(101010111100)_2=(?)_8=(?)_{16}$ ii) $(1100)_2+(1111)_2$ and $(123)_8+(126)_8$	5	CO9	L3
19		Write the truth table of an OR function and realize an OR gate using diodes.	5	CO9	L3
20		Realize a half adder using AND, OR and inverter logic gates. Write the truth table.	5	CO9	L3
21		Draw the full adder circuit with the truth table.	5	CO9	L3
22		Explain the logic circuit of XOR gate with truth table.	5	CO9	L3
23		Realize the following expression using the NOR gate Y=A(B+C)	5	CO9	L3
24		Subtract $(57)_{10}$ from $(43)_{10}$ using 2's complement form	5	CO9	L3
25		Realize two input EX-OR gate using only NAND gates.	5	CO9	L3
26		Show that NAND gate is a universal gate (Realize basic gates)	5	CO9	L3
27	.	Realize Y=AB+AB using minimum number of NAND gates.	5	CO9	L3
28		Simplify ABC+A B$\bar{C}$+A$\bar{B}$C + A $\bar{B}\bar{C}$	5	CO9	L3
29		Perform the following conversions: I) $(ABCD.EF)_H=(?)_8$ ii) $(988.86)_{10}=(?)_2$	5	CO9	L3
30		Write the decimal equivalent of $(10AB)_{16}$	5	CO9	L3
31		Convert $(ABCD)_{16}=(?)_2=(?)_8=(?)_{10}$	5	CO9	L3
32		Subtract: $(28)_{10}$ – $(19)_{10}$ using both 1's compliment and 2's compliment.	5	CO9	L3
33		Convert $(FA876)_{16}$ = $(?)_2$	5	CO9	L3
34		With the help of a diode switching circuit and truth table explain the operation of an AND gate and OR gate	5	CO9	L3
35		Convert $(10110101001.101011)_2$ =$(?)_{16}$	5	CO9	L3
36		What are universal gates? Realize AND and OR gates using universal gates.	5	CO9	L3
37		Add $(7AB.67)_{16}$ with $(16C.71)_{16}$	5	CO9	L3
38		Convert $(1101101)_2=(?)_{10}$ and $(96)_{10}=(?)_2$.	5	CO9	L3
39		Subtract $(19)_{10}$ from $(15)_{10}$ using 1's and 2's compliment	5	CO9	L3

		methods			
40		Design a logic circuit using basic gates with three inputs A,B,C and output Y that goes low only when A is high and B and C are different	5	CO9	L3
41		Convert $(1AD.E0)_{16}=(?)_{10}=(?)_8$	5	CO9	L3
42		Convert $(356.15)_8=(?)_2=(?)_{10}$	5	CO9	L3
43		Draw the full adder circuit with the truth table.	5	CO9	L3
44		Explain the logic circuit of XOR gate with truth table.	5	CO9	L3
45		Realize the following expression using the NOR gate Y=A(B+C)	5	CO9	L3
46		Subtract $(57)_{10}$ from $(43)_{10}$ using 2's complement form	5	CO9	L3
47		Realize two input EX-OR gate using only NAND gates.	5	CO9	L3
48		Show that NAND gate is a universal gate (Realize basic gates)	5	CO9	L3
49		Realize Y=AB+AB using minimum number of NAND gates.	5	CO9	L3
50		Simplify $ABC+A\ \bar{B}C+A\bar{B}\bar{C}+\ A\bar{B}C$	5	CO9	L3
51		Perform the following conversions: I) $(ABCD.EF)_H=(?)_8$ ii) $(988.86)_{10}=(?)_2$	5	CO9	L3
52		Write the decimal equivalent of $(10AB)_{16}$	5	CO9	L3
53		Convert $(ABCD)_{16}=(?)_2=(?)_8=(?)_{10}$	5	CO9	L3
54		Subtract: $(28)_{10}$ – $(19)_{10}$ using both 1's compliment and 2's compliment.	5	CO9	L3
55		Convert $(FA876)_{16}$ = $(?)_2$	5	CO9	L3
56		With the help of a diode switching circuit and truth table explain the operation of an AND gate and OR gate	5	CO9	L3
57		Convert $(10110101001.101011)_2$ =$(?)_{16}$	5	CO9	L3
58		What are universal gates? Realize AND and OR gates using universal gates.	5	CO9	L3
59		Add $(7AB.67)_{16}$ with $(16C.71)_{16}$	5	CO9	L3
60		Convert $(1101101)_2=(?)_{10}$ and $(96)_{10}=(?)_2$.	5	CO9	L3
61		Subtract $(19)_{10}$ from $(15)_{10}$ using 1's and 2's compliment methods	5	CO9	L3
62		Design a logic circuit using basic gates with three inputs A, B, C and output Y that goes low only when A is high and B and C are different	5	CO9	L3
63		Convert $(1AD.E0)_{16}=(?)_{10}=(?)_8$	5	CO9	L3
64		Convert $(356.15)_8=(?)_2=(?)_{10}$	5	CO9	L3
65		With the help of a diode switching circuit and truth table explain the operation of an AND gate and OR gate	5	CO9	L3
66		Convert $(10110101001.101011)_2$ =$(?)_{16}$	5	CO9	L3

F. EXAM PREPARATION

1. University Model Question Paper

Course:	Basic Electronics					Month / Year	May /2018
Crs Code:	18ELN24	Sem:	I	Marks:	100	Time:	180 minutes

-	Note	Answer all FIVE full questions. All questions carry equal marks.	Marks	CO	Level
1	a	**NEW SCHEME**			
	b				
	c				
	d				
		OR			
-	a				
	b				
	c				
	d				

EC
Prepared by Checked by Approved

2	a				
	b				
	c				
	d				
		OR			
-	a				
	b				
	c				
	d				
3	a				
	b				
	c				
	d				
		OR			
	a				
	b				
	c				
	d				
4	a				
	b				
	c				
	d				
		OR			
	a				
	b				
	c				
	d				
5	a				
	b				
	c				
	d				
		OR			
	a				
	b				
	c				
	d				

2. SEE Important Questions

Course:	Basic Electronics					Month / Year	May /2018
Crs Code:	18ELN24	Sem:	1	Marks:	100	Time:	180 minutes

	Note	Answer all FIVE full questions. All questions carry equal marks.	-	-	
Module	Qno.	Important Question	**Marks**	**CO**	**Year**
1	1	What is rectifier? Draw the circuit for HWR and explain its working? Derive the expression for I_{DC} efficiency η PIV, RMS value of voltage	5	CO2	2011
	2	Draw the circuit for FWR and explain its workintg? Derive the expression for I_{DC} efficiency η PIV, RMS value of voltage	5	CO2	2013
	3	With neat circuit diagram explain working princirples of bridge wave	5	CO2	2011

		rectifier?			
	4	Explain the performance of zener diode in terms of souce and load effects.	5	C01	2011
	5	Explain photo diode with neat diagram?	5	C02	2013
2	1	Draw the drain characteristics of a n-channel JFET and explain it.	5	C03	2013
	2	Explain the construction and operation of MOSFET	5	C03	2011
	3	Sketch and explain the VI characteristics if SCR?	5	C04	2011
	4	Draw two transister equivalent model of SCR.	5	C04	2010
	5	Explain phase control application using SCR	5	C04	2012
3	1	Explain the ideal opamp characteristics.	5	C05	2011
	2	Explain the following i)CMRR II)Slew rate iii) PSRR	5	C05	2013
	3	With a help of circuit diagram, derive the output voltage for integrator	5	C06	2011
	4	Show how an opamp can be used as differentiator. derive expression for output voltage	5	C06	2011
	5	Draw the following circuit using opamp: i)adder ii) voltage follower.	5	C06	2015
4	1	Explain how BJT can be used as an amplifier.	5	C07	2013
	2	Give four advantages of negative feedback in amplifier.	5	C07	2010
	3	With circuit explain the working of RC phase shift oscillator.	5	C08	2010
	4	Explain barkhausen criterian for oscillation.	5	C08	2011
	5	Explain with a neat diagram weinbridge oscillator.	5	C08	2015
5	1	What are universal gates? Realize AND and OR gates using universal gates.	5	C09	2011
	2	Subtract $(57)_{10}$ from $(43)_{10}$ using 2's complement form	5	C09	2013
	3	Realize two input EX-OR gate using only NAND gates.	5	C09	2015
	4	Explain with a neat diagram shift register	5	C09	2012
	5	With a neat diagram explain communication systems.	5	C010	2012