CURRICULUM – 2018

(C-18)

DIPLOMA IN ELECTRONICS &COMMUNICATION ENGINEERING

STATE BOARD OF TECHNICAL EDUCATION & TRAINING
TELANGANA, HYDERABAD

III SEMESTER

C-18 DECE SEMESTER III TEACHING AND EXAMINATION SCHEME															
S. NO	**Course**		**Teaching Scheme**					**Examination Scheme**							
			Instruction Periods per week			**Total Periods per semester**	**Credits**	**Continuous Internal Evaluation (CIE)**			**Semester End Examination (SEE)**				
	Code	**Course Name**	**L**	**T**	**P**			**Mid Sem 1**	**Mid Sem 2**	**Internal Evaluation**	**Max marks**	**Min marks**	**Total Marks**	**Min marks for passing including internal**	
1	18EC-301F	Applied Engineering Mathematics	3	1	0	60	3	20	20	20	40	14	100	35	
2	18EC-302C	Digital Electronics	3	1	0	60	3	20	20	20	40	14	100	35	
3	18EC-303C	Electronic Devices & Circuits	3	1	0	60	3	20	20	20	40	14	100	35	
4	18EC-304C	Analog Communication systems	3	1	0	60	3	20	20	20	40	14	100	35	
5	18EC-305C	Network Analysis	3	1	0	60	3	20	20	20	40	14	100	35	
6	18EC-306P	Electronic Devices Lab	1	0	2	45	1.5	20	20	60	40	20	100	50	
7	18EC-307P	Network Analysis & Analog Communications lab Practice	1	0	2	45	1.5	20	20	60	40	20	100	50	
8	18EC-308P	Digital Electronics lab Practice	1	0	2	45	1.5	20	20	60	40	20	100	50	
9	18EC-309P	Circuit Design & Simulation Lab	1	0	2	45	1.5	20	20	60	40	20	100	50	
10	18EC-310P	Communication and Life skills lab	1		2	45	1.5	20	20	60	40	20	100	50	
11		**Skill Upgradation**	0	0	7	105	2.5	0	0	**Rubrics**			--	-	
		TOTAL	**20**	**5**	**17**	**630**	**25**	**100**	**100**	**400**	**400**	**170**	**1000**	**425**	

Note: For Activities student performance is to be assessed through Rubrics.

Pass criteria: The minimum marks required for passing in any of courses are given below

1.Cumulative 35% (Mid sem 1 + Mid sem 2+ Tutorials+ End examination) and minimum marks in end examination is 35% (i.e.14marks).

2. If the cumulative of CIE is less than 35% (i.e.21 marks out of 60) therefore more than 35% of SEE is required to get overall 35%.

3

APPLIED ENGINEERING MATHEMATICS

Course Title **: APPLIED ENGINEERING MATHEMATICS**	Course Code **: 18EC-301F**
SEMESTER : **III**	Course Group **: Foundation**
Teaching Scheme (L : T : P) : **3 :1 : 0 (** in Periods)	Credits : **3 Credits**
Type of Course : **Lecture + Assignments**	Total Contact Periods : **60**
CIE : 6**0 Marks**	SEE : **40 Marks**
Programmes : **Common to all Engineering Diploma Programmes**	

Pre requisites

This course requires the knowledge of Basic Engg. Mathematics and Engg. Mathematics at Diploma 1st and 2nd Semester level.

Course Outcomes: COs

At the end of the course, the student will have the ability to:

CO 1	Integrate different kinds of functions
CO 2	Integrate functions using different methods
CO 3	Find the values of definite integrals.
CO 4	Solve simple problems of Areas, Volumes.
CO 5	Find the Mean and RMS values of various functions and Approximate values of Definite integrals using Trapezoidal and Simpson's 1/3rd rule
CO 6	Form the Differential Equation and Solve Simple DEs of 1st order and 1stdegree.

Course Content:

Unit-I **Duration: 10 Periods (L: 6.0 – T:4.0)**

Indefinite Integration-I

Integration regarded as anti-derivative – Indefinite integral of standard functions. Properties of indefinite integral. Integration by substitution or change of variable. Integrals of the form $\sin^m\theta . \cos^n\theta$. where m and n are positive integers. Integrals of tan x, cot x, sec x, cosec x and powers of tan x, sec x by substitution.

Evaluation of integrals which are reducible to the following forms:

$i)\ \frac{1}{a^2+x^2}, \frac{1}{a^2-x^2}, \frac{1}{x^2-a^2}$

$ii)\ \frac{1}{\sqrt{a^2+x^2}}, \frac{1}{\sqrt{a^2-x^2}}, \frac{1}{\sqrt{x^2-a^2}}$

$iii)\ \sqrt{x^2+a^2}, \sqrt{a^2-x^2}, \sqrt{x^2-a^2}$

Unit – II **Duration: 08 Periods (L: 4.8 – T:3.2)**

Indefinite Integration-II

Integration by decomposition of the integrand into simple rational algebraic functions. Integration by parts, Bernoulli's rule.

Unit-III **Duration: 06 Periods (L: 3.6 – T:2.4)**

Definite Integral and its Properties:

Definite integral-fundamental theorem of integral calculus, properties of definite integrals, evaluation of simple definite integrals. Definite integral as the limit of a sum.

Unit – IV **Duration: 10 Periods (L: 6.0 – T:4.0)**

Applications of Definite Integrals:

Areas under plane curves – Sign of the Area – Area enclosed between two curves. Solid of revolution – Volumes of solids of revolution.

Unit – V **Duration: 08 Periods (L: 4.8 – T:3.2)**

Mean, RMS values and Numerical Integration:

Mean values and Root Mean Square values of a function on a given interval.

Trapezoidal rule, Simpson's 1/3 rule to evaluate an approximate value of a definite integral.

Unit – VI **Duration: 18 Periods (L: 10.8 – T:7.2)**

Differential Equations of First Order:

Definition of a differential equation – order and degree of a differential equation – formation of differential equations – solution of differential equation of first order, first degree : variables - separable, homogeneous, exact, linear differential equation, Bernoulli's equation.

Suggested Learning Outcomes

Unit-I

1.0 Use Indefinite Integration to solve engineering problems

1.1 Explain the concept of Indefinite integral as an anti-derivative.

1.2 State the indefinite integral of standard functions and properties of Integrals $\int (u + v)\, dx$ And $\int ku\, dx$ where k is constant and *u, v* are functions of *x.*

1.3 Solve integration problems involving standard functions using the above rules.

1.4 Evaluate integrals involving simple functions of the following type by the method of substitution.

i) $\int f(ax + b)\, dx$ *where* $f(x)\, dx$ is in standard form.

ii) $\int [f(x)]^n f'(x)\, dx$

iii) $\int f'(x)/[f(x)]\, dx$

iv) $\int f\{g(x)\} g'(x)\, dx$

1.5 Find the Integrals of *tan x, cot x, sec x* and *cosec x using*the above.

1.6 Evaluate the integrals of the form $\int Sin^m\theta Cos^n\theta .\, d\theta$ where m and n are positive integers.

1.7 Evaluate integrals of powers of *tan x* and *sec x*.

1.8 Evaluate the Standard Integrals of the functions of the type

$$i)\ \frac{1}{a^2+x^2}, \frac{1}{a^2-x^2}, \frac{1}{x^2-a^2}$$

$$ii)\ \frac{1}{\sqrt{a^2+x^2}}, \frac{1}{\sqrt{a^2-x^2}}, \frac{1}{\sqrt{x^2-a^2}}$$

$$iii)\ \sqrt{x^2+a^2}, \sqrt{a^2-x^2}, \sqrt{x^2-a^2}$$

1.9 Evaluate the integrals of the type

$$\int \frac{1}{a \pm bSin\theta} d\theta, \int \frac{1}{a \pm b\cos\theta} d\theta \text{ and } \int \frac{1}{a\cos\theta \pm b\sin\theta \pm c} d\theta .$$

Unit-II

2.0 Use Indefinite Integration to solve engineering problems

2.1 Evaluate integrals using decomposition method.

2.2 Evaluate integrals using integration by parts with examples.

2.3 State the Bernoulli's rule for evaluating the integrals of the form $\int u.v dx$.

2.4 Evaluate the integrals of the form $\int e^x [f(x) + f'(x)]\, dx$.

Unit-III

3.0 Understand definite integral and use it in engineering applications

3.1 State the fundamental theorem of integral calculus

3.2 Explain the concept of definite integral.

3.3 Calculate the definite integral over an interval.

3.4 State various properties of definite integrals.

3.5 Evaluate simple problems on definite integrals using the above properties.

3.6 Explain definite integral as a limit of sum by considering an area.

Unit –IV

4.0 Understand definite integral and use it in engineering applications

4.1 Find the Areas under plane curves and area enclosed between two curves using integration.

4.2 Obtain the Volumes of solids of revolution.

Unit –V

5.0 Understand Mean, RMS values and Numerical Methods

5.1 Obtain the Mean value and Root Mean Square (RMS) value of the functions in any given Interval.

5.2 Explain the Trapezoidal rule, Simpson's 1/3 rules for approximation of definite integrals andprovide some examples.

Unit –VI

6.0 Solve Differential Equations in engineering problems.

6.1 Define a Differential equation, its order and degree

6.2 Form a differential equation by eliminating arbitrary constants.

6.3 Solve the first order first degree differential equations by the following methods:

i. Variables Separable.

ii. Homogeneous Equations.

iii. Exact Differential Equations

iv. Linear differential equation of the form $dy/dx + Py = Q$,

where P and Q are functions of x or constants.

v. Bernoulli's Equation (Reducible to linear form.)

6.4 Solve simple problems leading to engineering applications by using above methods.

Reference Books:

1. Integral Calculus Vol.I, by M.Pillai and Shanti Narayan

2. Thomas' Calculus, Pearson Addison –Wesley Publishers

Suggested E-Learning references

1. www.freebookcentre.net/mathematics/introductory-mathematics-books.html

2.E-books:www.mathebook.net

Suggested Student Activities

1. Student visits Library to refer Standard Books on Mathematics and collect related material
2.Quiz
3.Group discussion
4.Surprise tests
5. Seminars
6. Home Assignments

CO / PO - MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	Mapped POs
CO1	3	2	2	1			1			3	1,2,3,4,7,10
CO2	3	2	2	1			1			3	1,2,3,4,7,10
CO3	3	2	2	1			1			3	1,2,3,4,7,10
CO4	3	2	2	1			1			3	1,2,3,4,7,10
CO5	3	2	2	1			1			3	1,2,3,4,7,10
CO6	3	2	2	1			1			3	1,2,3,4,7,10

MID SEM EXAMINATIONS

S.No	Unit Name	MID SEM-I EXAM			
		R	U	A	Remarks
1	Unit-I	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-II	3, 4	6(a) 6(b)	8(a) 8(b)	
	Total Questions	4	4	4	
S.No	**Unit Name**	**MID SEM-II EXAM**			
		R	U	A	Remarks
1	Unit-III	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-IV	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

SMESTER END EXAMINATIONS

Sl No	Unit No.	Questions to be set for SEE					Remarks
		R(1 Mark)			U(3 Marks)	A(5 Marks)	
1	I	4	1		9(a)	13(a)	
2	II						
3	III		2		10(a)	14(a)	
4	IV						
5	V		3	5, 6	9(b)	13(b)	
					11(a)	15(a)	
					11(b)	15(b)	
6	VI			7,8	10(b)	14(b)	
					12(a)	16(a)	
					12(b)	16(b)	
Total Questions		8			8	8	

MODEL QUESTION PAPERS

Code: C18-EC-301F

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA

BOARD DIPLOMA EXAMINATIONS

MID SEM –I, MODEL PAPER, III SEMESTER

APPLIED ENGINEERING MATHEMATICS

TIME: 1: 00 Hour Max. Marks: 20

PART-A

Instructions: 1. Answer **ALL** questions 04 X 01 = 04

2 Each question carries **ONE** mark

1. Integrate: $e^x - \sin x + x^4$
2. Find : $\int \frac{dx}{5x+7}$ dx
3. Write Bernoulli's rule of integration
4. Find : $\int x \log x \, dx$

PART-B

Instructions: 1. Answer any **TWO** questions 02 X 03 = 06

2. Each question carries **THREE** marks

5 a). Evaluate : $\int \frac{x^5}{1+x^{12}} dx$.

Or

5 b) Evaluate : $\int \frac{dx}{(x^{2+}25)}$

6 a). Evaluate : $\int x \, sinx dx$

Or

6 b).Evaluate : $\int \frac{3x+2}{(x-1)(2x+3)} dx$.

PART C

Instructions: 1. Answer any **TWO** questions 02 X 05 = 10

2. Each question carries **FIVE** marks

7 a). Evaluate $\int \sqrt{x^2 + 2x + 5}\, dx$

Or

7 b) Evaluate : $\int cosx\, cos2x dx$.

8 a). Find $\int xTan^{-1}x dx$.

Or

8 b) Find $\int x^4 Cos2x dx$.

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Code: C18EC-301F

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA

BOARD DIPLOMA EXAMINATIONS

MID SEM –II, MODEL PAPER, III SEMESTER

APPLIED ENGINEERING MATHEMATICS

TIME: 1: 00 Hour Max. Marks: 20

PART-A

Instructions: 1. Answer **ALL** questions 04 X 01 = 04

2 Each question carries **ONE** mark

1. Integrate : $\int_0^1 (x^4 + 1)\, dx$
2. Evaluate : $\int_0^{\pi} Sin3x dx$
3. Evaluate : $\int_0^1 \frac{1}{1+x^2} dx$
4. Write the formula to find area bounded by the curve y= f(x) , x-axis,between the limits x=a and x =b

PART-B

Instructions: 1. Answer any **TWO** questions 02 X 03 = 06

2. Each question carries **THREE** marks

Find the Mean value of the function y = logx on [1 , e]

5 a) Evaluate: $\int_0^{\frac{\pi}{2}} \sqrt{1 - Sin2x} dx$

Or

5 b) Evaluate : $\int_0^{\frac{\pi}{2}} sin^2 x dx$

6 a). Find the area bounded by the line 2x + y =8, x-axis and the lines x = 2 and x = 4.

Or

6 b). Find the Volume of the Solid generated by revolving the part of the Circle $x^2 + y^2 = 36$

From x = 0 to x = 4 about x – axis.

PART C

Instructions: 1. Answer any **TWO** questions 02 X 05 = 10

2. Each question carries **FIVE** marks

7 a). Evaluate: $\int_0^{\frac{\pi}{2}} \frac{\sqrt{Sinx}}{\sqrt{Sinx}+\sqrt{Cosx}}\,dx$

Or

7 b). Evaluate : $\int_0^{\frac{\pi}{2}} \log sin\, x dx$

8 a) Find the area enclosed between the Parabolas $y = 3x - x^2 and y = x^2 - x.$

Or

8 b). Find the Volume of the Solid generated by the revolution of the area bounded by the

Ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$, about x- axis.

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18EC-301F

BOARD DIPLOMA EXAMINATION,(C-18)

MODEL PAPER

III SEMESTER EXAMINATION

APPLIED ENGINEERING MATHEMATICS

Time: 2 hours [Total Marks: 40]

PART-A

Instructions: 1. Answer **ALL** questions 08 X 01 = 08

2 Each question carries **ONE** mark

1. Integrate: $x^7 - 3/x$

2. Evaluate: $\int_0^1 (x^2 + 1)$ dx

3. Write the formula to find mean value of y = f(x), in the interval (a, b)

4. Find the Order and Degree of the Differential Equation $x\frac{dy}{dx} = \sqrt{1 + \left(\frac{dy}{dx}\right)^2}$.

5 Write Trapezoidal Rule to find the approximate value of $\int_a^b f(x)dx$.

6. Write the formula to find RMS value of y = f(x) over the range x=a and x = b.

7. Solve: $\frac{dy}{dx} = e^{2x+y}$

8. Write the condition for exactness of the differential equation M(x,y)dx + N(x,y)dy =0

PART-B

Instructions: 1. Answer any **FOUR** questions 04 X 03 = 12

2. Each question carries **THREE** marks

9 a). Evaluate: $\int_0^{\frac{\pi}{2}} \sqrt{1 - Sin2x}dx$

Or

9 b) Find the approximate value of $\int_0^6 \frac{dx}{1+x}$ by taking n = 6 using Trapezoidal rule.

10 a) Find the area bounded by the Parabola $y = x^2 - 2x + 1$ and x-axis.

Or

10 b) Form the Differential Equation from $y = Ae^x + Be^{3x}$ where A, B are arbitrary Constants.

11 a) Find the RMS value of $\sqrt{\log x}$ over the range x= 1 and x= e

Or

11 b) Calculate approximate value of $\int_0^4 \frac{dx}{1+x}$ by taking n= 4 using Simpson's 1/3 rule

12 a) Solve: $x\frac{dy}{dx} + 2y = logx$.

Or

12 b) Solve: $x(1-y^2)dx + y(1-x^2)dy = 0$

PART C

Instructions: 1. Answer any **FOUR** questions 04 X 05 = 20

2. Each question carries **FIVE** marks

13 a) Evaluate: $\int \frac{1}{x^2+2x+2}$ dx

Or

13 b) Find the RMS value of y = $\sqrt{8-4x^2}$ between x = 0 and x = 2

14 a) Find the volume of solid generated by revolving the Ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ about Major axis

Or

14 b) Solve: $\frac{dy}{dx} = Sin(x+y)$

15 a) A curve is drawn to passing through the points given by the following table:

x	1	1.5	2	2.5	3	3.5	4
y	3	3.4	3.7	3.8	2.7	2.6	2.1

Calculate the approximate area bounded by the curve , x-axis and the lines x= 1 and x= 4 using Simpson's 1/3 rule

Or

15 b) Evaluate: $\int_0^1 \sqrt{(1-x^2)}dx$ approximately by taking n = 4 using

Simpson's 1/3 rd Rule.

16 a) Solve : $(y^2 - xy)dx = x^2dy$.

Or

16 b) . Solve: $\frac{dy}{dx} + yCosx = y^3$Sin2x.

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SUGGESTED ACTIVITIES FOR - APPLIED ENGINEERING MATHEMATICS

ACTIVITY ASSESSMENT :

1. **Mathematical concepts**
2. **Procedure**
3. **Explanation**
4. **Working with others**
5. **Mathematical errors**

ACTIVITIES:

1 .Write a short notes on different types of integrals.

2. Prepare a notes on different methods to evaluate integrals.

3. List out Properties of definite integrals.

4. List out and explain various applications of definite integrals.

5. Explain the procedure to solve problems on Areas using integration

6. Explain the procedure to find volumes of irregular shapes of solids of revolution using integration.

7. Prepare a presentation to find Mean values and R.M.S values of any given function.

8. Explain the procedure to calculate approximate area by using Trapezoidal rule.

9. Explain the procedure to calculate approximate area by Simpson's 1/3 rule

10. Prepare a presentation on solving 1^{st} order differential equations using any suitable method.

Rubrics for Activity assessment

CATEGORY	**4**	**3**	**2**	**1**
Mathematical Concepts	Explanation shows complete understanding of the mathematical concepts used to solve the problem(s).	Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s).	Explanation shows some understanding of the mathematical concepts needed to solve the problem(s).	Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written.
Procedures	Typically, uses an efficient and effective procedure to solve the problem(s).	Typically, uses an effective procedure to solve the problem(s).	Sometimes uses an effective procedure to solve problems, but does not do it consistently.	Rarely uses an effective procedure to solve problems.

Explanation	Explanation is detailed and clear.	Explanation is clear.	Explanation is a little difficult to understand, but includes critical components.	Explanation is difficult to understand and is missing several components OR was not included.
Working with Others	Student was an engaged partner, listening to suggestions of others and working cooperatively throughout lesson.	Student was an engaged partner but had trouble listening to others and/or working cooperatively.	Student cooperated with others, but needed prompting to stay on-task.	Student did not work effectively with others.
Mathematical Errors	90-100% of the steps and solutions have no mathematical errors.	Almost all (85-89%) of the steps and solutions have no mathematical errors.	Most (75-84%) of the steps and solutions have no mathematical errors.	More than 75% of the steps and solutions have mathematical errors.

CO / PO - MAPPING OF ACTIVITIES:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1			1	2	2	3
CO2	3	2	2	1			1	2	2	3
CO3	3	2	2	1			1	2	2	3
CO4	3	2	2	1			1	2	2	3
CO5	3	2	2	1			1	2	2	3
CO6	3	2	2	1			1	2	2	3
CO7	3	2	2	1			1	2	2	3
CO8	3	2	2	1			1	2	2	3
CO9	3	2	2	1			1	2	2	3
CO10	3	2	2	1			1	2	2	3

DIGITAL ELECTRONICS

Course Title :	**DIGITAL ELECTRONICS**	Course Code	**18EC-302 C**
Semester	**III**	Course Group	**Core**
Teaching Scheme in Hrs(L:T:P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact periods :	**60Pds**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

This course requires the basic knowledge of electronics in Basic Physics at Secondary school level .

Course Outcomes

CO1	Convert number systems and Solve Boolean expressions using K-map.
CO2	Compare various digital IC logic families and identify them by their characteristics.
CO3	Design adders using Combinational logic.
CO4	Develop Combinational logic circuits like MUX , De-mux, encoder, decoder and comparator circuits.
CO5	Identify the need of sequential circuits and design registers using flip-flops.
CO6	Design counter circuits and Compare different types of memories.

After completion of the course, the student should be able to

COURSE CONTENT

UNIT 1 –

Basics of Digital Electronics **Duration: 14 Periods (L: 8– T: 6)**

Convert number systems and Solve Boolean expressions using K-map.

Number systems –comparison with Decimal system-Conversion from number system into another – performing arithmetic operations in binary-Use of weighted and Un-weighted codes- importance of parity Bit- Different postulates in Boolean algebra- Basic logic gates with truth table- universal logic gates - exclusive – OR gate with truth table- De-Morgan's theorems- AND, OR, NOT operations using NAND, NOR gates- De-Morgan's theorems related postulates to simplify Boolean expressions (up to three variables)- standard representations for logical functions (SOP and POS form)- Boolean expressions from the given truth table- Karnaugh map to simplify Boolean Expression (up to 4 variables only)

UNIT2 –

Digital IC logic families Duration: 6 Periods (L: 6– T: 0)

Compare various digital IC logic families and identify them by their characteristics.

Classification of digital logic families- Important characteristics of Digital ICs- requirements of TTL and CMOS ICs - Propagation delay and Noise margin- Fan-in and Fan-out capacity- Power dissipation- Figure of merit of a logic family- explain TTL NAND gate with open collector- TTL NAND gate with Totem pole output- CMOS NAND gate circuit – Compare logic families- IC numbers of two input Digital IC Logic gates.

UNIT 3–

Design adders using Combinational logic . **Duration: 10 Periods (L: 8– T: 2)**

Concept of combinational logic circuits- Half adder circuit -truth table- Half-adder using NAND gates only &NOR gates only- Full adder circuit - Truth table- Full-adder using two Half-adders and an OR – gate - a 4 Bit parallel adder using full – adders- 2's compliment parallel adder/ subtractor circuit- Serial adder -Performance of serial and parallel adder-

UNIT 4–

Develop Combinational logic circuits like MUX, De-mux, encoder, decoder and comparator circuits. Duration: 10 Periods (L: 8– T: 2)

Operation of 4 X 1 Multiplexers- Operation of 1 to 4 demultiplexer- IC numbers -applications- 3 X 8 decoder- BCD to decimal decoder- Decoders- Decimal to BCD encoder- IC numbers -Applications - Tri-state buffer - Types of tri-state buffers-Applications - Digital comparator.

UNIT 5–

Identify the need of sequential circuits and design registers using flip-flops.

Duration: 12 Periods (L: 8– T: 2)

Concept of Sequential logic circuits- NAND and NOR latches with truth tables-Necessity of clock - Clocked SR flip flop circuit using NAND gates- Need for preset and clear inputs - Circuit of Clocked JK flip flop (using S-R flip-flops) with truth table -Race around condition- Master slave JK flip flop circuit - clocked D and T flip flops - Truth table, Circuit diagram and timing diagram- Symbols of above Flip Flops- Truth tables - Applications for each type of flip flop- Need for a Register - Types of registers- 4 bit shift left and shift right registers - 4-bit bi-directional shift Register - Parallel in parallel out shift register - Universal shift register (74194) - Applications of shift registers.

UNIT 6–

Design counter circuits and Compare different types of memories.

Duration: 8 Periods (L: 8– T: 0)

4-bit asynchronous counter - Asynchronous decade counter with a circuit - 4-bit synchronous counter–Differences between synchronous and asynchronous counters- asynchronous 3 bit up-down counter -Ring counter- applications - Types of memories - Memory read operation, write operation, access time, memory capacity, address lines and word length- ROM and RAM- Diode ROM- EEPROM and UVPROM- Dynamic MOS RAM cell- static RAM and dynamic RAM- Applications of Flash ROM.

Specific Learning Outcomes: upon completing this course the student will be able to

1.0 Understand the basics of Digital Electronics

1.1 Explain Binary, Octal, Hexadecimal number systems.

1.2 Compare the above with Decimal system.

1.3 Convert a given decimal number into Binary, Octal, and Hexadecimal numbers and vice versa.

1.4 Convert a given binary number into octal and hexadecimal number system and vice versa.

1.5 Perform binary addition, subtraction, Multiplication and Division.

1.6 Perform binary addition, subtraction, Multiplication and Division and check in decimal system.

1.7 Write 1’s complement and 2’s complement numbers for a given binary number.

1.8 Perform subtraction of binary numbers in 1’s complement method.

1.9 Perform subtraction of binary numbers in 2’s complement method.

1.10 State the use of weighted and Un-weighted codes and list the types.

1.11 Write Binary equivalent number for a number in 8421, Excess-3 code.

1.12 Convert a given binary number into Gray code and vice-versa.

1.13 Explain the use of alphanumeric codes (ASCII & EBCDIC)

1.14 State the importance of parity Bit.

1.15 State different postulates in Boolean algebra.

1.16 Explain the basic logic gates AND, OR, NOT gates with truth table.

1.17 Explain the working of universal logic gates (NAND, NOR gates) using truth tables.

1.18 Explain the working of an exclusive – OR gate with truth table.

1.19 Realize AND, OR, NOT operations using NAND, NOR gates.

1.20 Realize exclusive – OR gate using basic gates.

1.21 Realize exclusive – OR gate using NAND, NOR gates.

1.22 State De-Morgan's theorems.

1.23 Prove De-Morgan's theorems.

1.24 Apply De-Morgan's theorems related postulates to simplify Boolean expressions (up to four variables).

1.25 Explain standard representations for logical functions (SOP and POS form)

1.26 Write Boolean expressions from the given truth table and draw the circuit.

1.27 Use Karnaugh map to simplify Boolean Expression (up to 4 variables only) in SOP form.

1.28 Use Karnaugh map to simplify Boolean Expression (up to 4 variables only) in POS form.

2.0 Understand different logic families.

2.1 Give the classification of digital logic families (like TTL, CMOS and ECL).

2.2 List the important characteristics of Digital ICs

2.3 Explain logic levels and Voltage requirements of TTL and CMOS ICs.

2.4 Define propagation delay and Noise margin.

2.5 Define Fan-in and Fan-out capacity of a digital IC.

2.6 Define Power dissipation and figure of merit of a logic family.

2.7 Explain the working of open collector TTL NAND gate with a circuit diagram.

2.8 Explain the working of Totem pole output TTL NAND gate with a circuit diagram.

2.9 Explain the working of CMOS NAND gate with a circuit diagram.

2.10 Compare the TTL, CMOS and ECL logic families.

2.11 Give IC numbers of different two input Digital IC Logic gates(One for each type)

3.0 Understand the working of combinational logic circuits and adder circuits.

3.1 Define combinational logic circuit.

3.2 Define half adder circuit and write its truth table.

3.3 Write the output expression and draw half adder circuit using basic gates.

3.4 Realize a Half-adder using i) NAND gates only and ii) NOR gates only.

3.5 Explain the operation of full adder circuit with truth table.

3.6 Realize full-adder using two Half-adders and an OR – gate.

3.7 Write truth table for the above circuit.

3.8 Explain the working of 4 Bit parallel adder circuit using full adders.

3.9 Explain 2's compliment parallel adder/ subtractor circuit.

3.10 Explain the working of a serial adder circuit.

3.11 Compare the performance of serial and parallel adder.

4.0 **Understand the working of MUX, DE-MUX, Encoder and Decoder circuits.**

4.1 Define multiplexer and de-multiplexer.

4.2 Write the truth table of 4 X 1 Multiplexer and draw its circuit.

4.3 Write the IC numbers of TTL & CMOS Multiplexer ICs.

4.4 Mention any 3 applications of multiplexer circuit.

4.5 Write the truth table of 1 to 4 de- Multiplexer and draw its circuit.

4.6 Write the IC numbers of TTL & CMOS De-multiplexer ICs.

4.7 Mention any 3 applications of De-multiplexer.

4.8 Write the truth table of 3 X 8 decoder and draw its circuit.

4.9 Mention any 3 applications of decoder IC.

4.10 Explain the working of BCD to decimal decoder circuit.

4.11 Explain the working of Decimal to BCD encoder circuit.

4.12 State the need for a tri-state buffer.

4.13 List the two types of tri-state buffers with IC numbers.

4.14 Write the truth table of 2 bit digital comparator and draw its circuit.

5.0 Understand the working of Sequential logic circuits.

5.1 Define a Sequential logic circuit.

5.2 State the necessity of clock.

5.3 What is level and edge triggering?

5.4 Explain clocked SR flip flop circuit using NAND gates.

5.5 State the need for preset and clear inputs.

5.6 Explain the circuit of JK flip flop (using S-R flip-flops) with truth table.

5.7 What is race around condition in JK flip-flop?

5.8 Explain the working of master slave JK flip flop circuit with necessary diagrams.

5.9 Explain the level clocked D and T flip flops with the help of truth table, circuit diagram and timing diagram.

5.10 Draw the symbols of above Flip Flops.

5.11 Give the truth tables of edge triggered D and T flip flops.

5.12 List any 2 commonly used IC numbers of flip flops of each type.

5.13 List two applications for each type of flip flop.

5.14 State the need for a Register

5.15 List the four types of registers.

5.16 Explain the working of 4 bit shift left and shift right registers with a circuit and timing diagram.

5.17 Explain the working of 4-bit bi-directional shift register with a circuit and timing diagram.

5.18 Explain parallel in parallel out shift register with a circuit and timing diagram.

5.19 List any four common applications of shift registers.

5.20 List any 2 commonly used IC numbers of registers.

5.21 Distinguish between combinational and sequential circuits.

6.0 Understand working of Counters and Semiconductor memories

6.1 Define a counter and modulus of a counter.

6.2 Explain the working of 4-bit asynchronous up counter with a circuit and Timing diagram.

6.3 Explain the working of asynchronous 3 bit up-down counter with a circuit and Timing diagram

6.4 Explain the working of 4-bit synchronous counter with a circuit and Timing diagram.

6.5 Explain the working of decade counter with a circuit and Timing diagram.

6.6 Distinguish between synchronous and asynchronous counters.

6.7 List any 2 commonly used IC numbers of counters.

6.8 Explain the working of ring counter.

6.9 List any three applications for counters and ring counter.

6.10 State the need for memory in digital circuits.

6.11 Define the terms memory read operation, write operation, access time, memory capacity, and word length.

6.12 Classify various types of memories based on principle of operation, physical characteristics,accessing modes and fabrication technology.

6.13 Differentiate between ROM and RAM.

6.14 Explain the working of diode ROM.

6.15 Distinguish between EEPROM and UVPROM.

6.16 Explain the working of basic dynamic MOS RAM cell.

6.17 Compare static RAM and dynamic RAM.

6.18 State the need for Flash ROM.

6.19 List the applications of Flash ROM.

RECOMMENDED BOOKS

1. Digital Computer Electronics by Malvino and leach. 3rdedition Tata McGraw-Hill Education

2. Modern Digital Electronics By RP JAIN TMH

3. Digital Electronics: Principles & Applications by Roger L. Tokheim -McGraw-Hill Education, 2008

4. Digital Electronics by GK Kharate, Oxford University Press.

e-links

1. www.nptel.com
2. www.electronics4u.com

Suggested student activities.

1. Learn how to Test the digital IC's and submit a report.

2. Propose how to manage the e-waste.

3. Perform trouble shooting of the not working equipment in the lab.

4. Learn the latest CMOS IC equivalents of the TTL IC's.

5. Prepare a simple PCB to perform verification of truth table for basic gates.

6. Prepare a PPT on the day to day application of the gates you have studied.

CO PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching Periods
CO1 :	Convert number systems and Solve Boolean expressions using K-map.	R/U	1,2,10	14
CO2 :	Compare various digital IC logic families and identify them by their characteristics.	R/U	1,2,5,6,7	6
CO3 :	Design adders using Combinational logic.	R/U/A	1,2,9	10
CO4 :	Develop Combinational logic circuits like MUX , De-mux, encoder, decoder and comparator circuits.	R/U/A	1,2,5,7	10
CO5 :	Identify the need of sequential circuits and design registers using flip-flops.	R/U/A	1,2,5	12
CO6 :	Design counter circuits and Compare different types of memories.	R/U/A	1,2,3,7	8

MID SEM EXAMINATIONS

S.No	Unit Name	MID SEM-I EXAM			
		R	U	A	Remarks
1	Unit-I	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-II	3, 4	6(a) 6(b)	8(a) 8(b)	
	Total Questions	4	4	4	
S.No	**Unit Name**	**MID SEM-II EXAM**			
		R	U	A	Remarks
1	Unit-III	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-IV	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

SMESTER END EXAMINATIONS

Sl No	Unit No.	Questions to be set for SEE				Remarks
		R(1 Mark)		U(3 Marks)	A(5 Marks)	
1	I	4	1	9(a)	13(a)	
2	II					
3	III		2	10(a)	14(a)	
4	IV					
5	V		3	9(b)	13(b)	
			5, 6	11(a)	15(a)	
				11(b)	15(b)	
6	VI		7,8	10(b)	14(b)	
				12(a)	16(a)	
				12(b)	16(b)	
Total Questions		8		8	8	

C-18 III SEMESTER
18 EC-302C DIGITAL ELECTRONICS
MODEL PAPER MID- SEM I

IME : 1 HOUR MAX. MARKS : 20

PART-A

Answer ALL questions. 4 x 1= 4M

1. Convert the binary number 1101101 into its decimal equivalent.

2. Draw the logic symbol of AND and OR gates.

3. Define propagation delay with reference to digital IC.

4. Write CMOS IC nos. of AND and NAND gates.

PART – B

Answer ALL questions. 2 x 3 = 6 M

5 (a) Perform 2's complement of subtraction for the binary numbers 10110 – 110110

OR

5(b) Draw the symbol of NAND gate, write its truth table and output expression.

6(a) Define Fan-in and Fan-out capacity of a digital IC.

OR

6(b) Write the specifications of digital IC's.

PART – C

Answer ALL questions. 2 x 5 = 10 M

7(a) Explain the working of universal logic gates NAND and NOR with truth tables.

OR

7(b) Simplify the Boolean expression using De-Morgan's theorems and draw its simplified logic circuit.

$\bar{A}\bar{B}CD + B\bar{A}CD + \overline{C\overline{B}A}D + \text{ABCD} + B\bar{C}AD$

8(a) Draw the TTL totem pole circuit and explain.

OR

8(b) Compare the various logic families.

C-18 III SEMESTER
18 EC-302C DIGITAL ELECTRONICS
MODEL PAPER MID- SEM II

TIME : 1 HOUR MAX. MARKS : 20

PART-A

Answer ALL questions. 4 x 1= 4M

1. Define combinational logic circuit.

2. Draw the circuit of full adder using half adders.

3. Define a multiplexer.

4. Write any 2 IC nos. of multiplexers.

PART – B

Answer ALL questions. 2 x 3 = 6 M

5 (a) Explain the operation of full adder with a truth table.

OR

5(b) Compare the performance of serial adder and parallel adder.

6(a) Write the truth table of 1 x 4 de-multiplexer.

OR

6(b) Write any 3 applications for each of MUX and decoders.

PART – C

Answer ALL questions. 2 x 5 = 10 M

7(a) Explain the working of 4-bit parallel adder using half adders.

OR

7(b) Explain 2's compliment parallel adder/subtractor circuit.

8(a) Write the truth table of 1 x 8 demultiplexer and draw its circuit.

OR

8(b) Explain the working of BCD to decimal decoder circuit..

C-18 III SEMESTER
18 EC-302C DIGITAL ELECTRONICS
MODEL PAPER - SEMESTER END EXAMINATION

TIME : 2 HOURS MAX. MARKS : 40

PART-A

Answer ALL questions. 8 x 1= 8M

1. State any 2 postulates of Boolean algebra.

2. Define a de-multiplexer.

3. What is edge-triggering with reference to clock.

4. Draw the symbol of D and T flip-flop

5. List any 2 IC numbers of JK flip-flop.

6. List the synchronous inputs of a flip-flop.

7. Define modulus of a counter.

8. Define access time with reference to memory.

PART – B

Answer ALL questions. 4 x 3 = 12 M

9 (a) List out the specifications of digital IC's.

OR

9(b) Explain clocked SR flip flop using NAND gates.

10(a) Realize a half adder using NAND gates only.

OR

10(b) Distinguish between synchronous and asynchronous counters.

11(a) Write the logic symbol and negative edge triggered truth table of D flip-flop.

OR

11(b) State the need of a register and list its types.

12(a) Draw the circuit of a decade counter.

OR

12(b) Differentiate between ROM and RAM.

PART – C

Answer ALL questions. 2 x 5 = 10 M

13(a) Simplify the Boolean expression $\sum \pi M(1,3,6,8,14,15)$ using K- map and draw its simplified logic circuit.

OR

13(b) Explain the working of 4-bit left shift register with a circuit and timing diagram.

14(a) Explain the working of 4-bit bit parallel adder using full adders.

OR

14(b) Explain the working of diode ROM.

15(a) Explain the working of parallel-in and parallel-out register with circuit and timing diagram.

OR

15(b) Explain the working of master slave JK flip-flop circuit with necessary diagrams.

16(a) Classify various types of memories based on principle of operation, physical characteristics, accessing modes and fabrication technology.

OR

16(b) Explain the working of ring counter with a circuit and necessary timing diagrams.

ELECTRONIC DEVICES AND CIRCUITS

Course Title :	**Electronic devices and Circuits**	Course Code	**18EC-303C**
Semester	**III**	Course Group	**Core**
Teaching Scheme in Hrs(L:T:P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours :	**60Pds**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites :

This course requires the basic knowledge of Physics and Mathematics at Secondary school level ,and about operation of diode and Transistor

Course Outcomes:

Upon completion of the course, the student should be able to

Course Outcome	
CO1	Measure different parameters of a transistor amplifier using small signal model
CO2	Construct multi stage and feedback amplifiers using Transistors
CO3	Construct tuned amplifiers and power amplifiers using Transistors
CO4	Construct various oscillators using Transistors
CO5	Develop various applications using special semiconductor devices
CO6	Design wave shaping circuits using Diodes

Course Contents

Unit1-Small Signal Amplifiers: Duration: 10 Periods (L: 6– T:4)

Basic CE amplifier:- Different parameters of a Transistor amplifier- h-parameter model of CE, CB and CC configuration- Conversion of h-parameters from CE into CB and CC configuration- simple problems- CS FET amplifier

Unit -2: Multistage and Feedback amplifiers Duration: 10 Periods (L: 6– T:4)

Classify amplifier based on coupling- feedback and frequency- Multistage amplifiers – Different parameters- 2-stage RC coupled amplifier- 2-stage Transformer coupled amplifier- 2-stage Direct coupled amplifier- Darlington pair- Cascode amplifier- Feedback Amplifiers:- Concept of feedback- four types of negative feedback amplifiers- Effect of negative feedback- Merits and De-merits of Negative Feedback.

Unit 3 –Tuned and Power amplifiers Duration: 10 Periods (L: 6– T:4)

Voltage and Power Amplifier:- Difference between Voltage and Power amplifiers- Classification of power amplifiers- Class A single ended- Push-pull amplifier circuit- Effect of distortion in amplifiers- Choice of Class A , Class B Class AB Amplifier and Class C Amplifiers- Applications of Class C Amplifiers - Efficiencies of different types of power amplifiers(A,B, AB & C)

Unit -4:Oscillators **Duration: 10 Periods (L: 6– T:4)**

Oscillators: Barkhausen criteria in oscillators- Oscillator circuits- Hartley oscillator- Colpitts oscillator- Crystal Oscillator- Expressions for frequency of oscillation and condition for sustained oscillations of the above circuits- Reasons for instability in oscillator circuits- Remedies for instability in oscillators- Advantages of crystal oscillators- Merits and demerits of RC and LC oscillators.

Unit 5- Special semiconductor devices **Duration: 10 Periods (L: 6– T:4)**

Working principle: Varactor diode- UJT- Photo Diode- Photo transistor- Photo Voltaic Cell- LCD, Characteristics and Applications: Varactor diode- UJT- Photo Diode- Photo transistor- Photo Voltaic Cell- LCD, Merits and Demerits

UNIT- 6: Wave shaping circuits **Duration: 10 Periods (L: 6– T:4)**

Clippers: Design of simple clippers- Clamper circuits - Applications of clippers and clampers- Sweep Voltage generators, Applications of Voltage and current Time base circuits

Suggested Learning Outcomes:

After completing this course the student will be able to

1.0 Explain the working of Small Signal Amplifiers

1.1 Explain the working of basic amplifier circuit using BJT in CE mode.

1.2 Define the terms Av, Ai, Zi and Zo of an amplifier

1.3 Define frequency response and bandwidth of an amplifier

1.4 Explain the concept of Gain-Bandwidth product

1.5 Define h-parameters of a transistor

1.6 Draw the h-parameter model for CE, CB and CC Configuration

1.7 Derive expressions for Av, Ai, Zi and Zo using h-parameter model for CE configuration

1.8 Obtain h-parameters of CB and CC from CE parameters

1.9 Solve simple problems related to Av, Ai, Zi, Zo and Gain – bandwidth product

1.10 Draw the circuit of CS FET amplifier

1.11 Explain CS FET amplifier operation

1.12 Draw the JFET as current source circuit

1.13 Explain the use of JFET as current source

2.0 Explain the working of Multi-stage and Feedback amplifiers

2.1 Classify amplifiers based on coupling, feedback and frequency

2.2 State the need for multi-stage amplifiers

2.3 Define gain, frequency response and bandwidth of multi-stage amplifier

2.4 Give the expressions for gain, frequency response and bandwidth of multi-stage amplifier

2.5 Solve simple problems on overall gain, overall frequency response and overall bandwidth of multi-stage amplifiers

2.6 Draw 2-stage RC coupled amplifier circuit.

2.7 Explain the operation of 2-stage RC coupled amplifier.

2.8 Explain the frequency response of the above circuit.

2.9 Draw 2-stage Transformer coupled amplifier circuit.

2.10 Explain the operation of 2-stage Transformer coupled amplifier

2.11 Explain the frequency response of the above circuit.

2.12 Draw 2-stage Direct coupled amplifier circuit.

2.13 Explain the operation of 2-stage Direct coupled amplifier

2.14 Draw Darlington pair circuit.

2.15 Explain the operation of Darlington pair circuit.

2.16 Give the expression for current gain of Darlington pair circuit

2.17 Explain high current gain amplifier using Darlington pair

2.18 Draw Cascode amplifer.

2.19 Explain Cascode amplifer.

2.20 Draw the basic block diagram of a feedback amplifier.

2.21 Derive the expression for gain in a feedback amplifier.

2.22 Compare negative and positive feedback.

2.23 Draw the block diagram of voltage series feedback amplifier.

2.24 Draw the block diagram of voltage shunt feedback amplifier

2.25 Draw the block diagram of current series feedback amplifier

2.26 Draw the block diagram of current shunt feedback amplifier

2.27 State the effect of negative feedback on gain

2.28 State the effect of negative feedback on bandwidth

2.29 State the effect of negative feedback on input impedance

2.30 State the effect of negative feedback on output impedance

2.31 List the advantages of negative feedback amplifiers.

2.32 Solve simple problems on effect of negative feedback on gain, bandwidth, Zi and Zo

3.0 Explain the working of Power amplifiers and Tuned amplifiers

3.1 State the need for a power amplifier.

3.2 Distinguish between voltage and power amplifiers.

3.3 Classify power amplifier based on conduction.

3.4 Define Conversion efficiency

3.5 Define distortion in power amplifier

3.6 Draw the circuit of class A amplifier with resistor load.

3.7 Explain operation of class A amplifier with resistive load

3.8 Derive the expression for efficiency of the above circuit.

3.9 Draw the circuit of class A amplifier with transformer load.

3.10 Explain the operation of class A amplifier with transformer load.

3.11 Derive the expression for efficiency of the above circuit.

3.12 Draw the circuit of class-B push-pull amplifier.

3.13 Explain the operation of class-B push-pull amplifier

3.14 Derive the expression for efficiency of class-B push-pull amplifier.

3.15 List the advantages & disadvantages of push-pull amplifier.

3.16 Draw the circuit of complementary symmetry push-pull amplifier.

3.17 Explain the operation of complementary symmetry push-pull amplifier

3.18 List the conditions to avoid thermal runaway in a power transistor

3.19 State the necessity of heat sink for a power transistor.

3.20 List different types of heat sinks and mounting methods.

3.21 Classify tuned amplifiers.

3.22 Draw single tuned amplifier circuit.

3.23 Explain the operation of single tuned amplifier circuit

3.24 Draw double tuned amplifier circuit

3.25 Explain the operation of double tuned amplifier circuit

3.26 Draw class C tuned amplifier circuit.

3.27 Explain class C tuned amplifier circuit with waveforms

3.28 List applications of tuned circuits

4..0 Explain the working of Oscillators

4.1 State the condition for an amplifier to work as oscillator.

4.2 Mention the requisites of an oscillator.

4.3 State Barkhausen criteria in oscillators.

4.4 Classify oscillator circuits.

4.5 Draw the Hartely oscillator circuit.

4.6 Explain the working of Hartely oscillator circuit

4.7 Mention the condition for sustained oscillations in Hartley Oscillator

4.8 Give the expression for frequency of oscillations in Hartley Oscillator

4.9 Draw the Colpitts oscillator circuit.

4.10 Explain the working of Colpitts oscillator circuit

4.11 Mention the condition for sustained oscillations in Colpitts Oscillator

4.12 Give the expression for frequency of oscillations in Colpitts Oscillator

4.13 Draw the equivalent circuit of crystal and explain.

4.14 Draw the transistor crystal oscillator circuit.

4.15 Explain the working of transistor crystal oscillator circuit

4.16 List the advantages of crystal oscillator

4.17 State the reasons for instability in oscillator.

4.18 Mention the remedies to avoid instability in oscillators.

4.19 Compare the LC and RC oscillators

5.0 Explain the working of special Semiconductor devices

5.1 Explain the working principle of varactor diode.

5.2 Draw the characteristics of Varactor Diode.

5.3 Explain the working principle of UJT with its equivalent circuit

5.4 Draw UJT characteristics.

5.5 Explain UJT characteristics.

5.6 List the application of varactor diode

5.7 List applications of UJT.

5.8 Explain constructional details of photo diode.

5.9 Draw the characteristics of photo diode.

5.10 Explain operation of photo diode.

5.11 Explain constructional details of photo transistor.

5.12 Draw the characteristics of photo transistor.

5.13 Explain operation of photo transistor.

5.14 Explain the principle of photovoltaic cell.

5.15 Explain the working principle of LCD

5.16 Mention the types of LCD displays

5.17 Give constructional details of LCD

5.18 List the merits and demerits of LCD Displays

5.19 List the applications of LCD

6.0 Wave shaping Circuits

6.1. List the different types of clippers.

6.2. Explain the unbiased and biased clippers with waveforms

6.3. Explain the double ended clipper with waveforms

6.4. Draw the output waveforms of a given clipper circuit for sinusoidal/square input

6.5. Draw the clipper circuits for a given input and output waveforms

6.6. Explain the principle of clamper circuit with waveforms

6.7. Mention the applications of clippers and clampers

6.8. Design simple clippers and clampers for a given input and output waveform

6.9. Define Sweep Voltage.

6.10. State the fundamental consideration of sweep waveform.

6.11. Distinguish between voltage and current time-base generation

6.12. List errors in sweep signal

6.13. Draw simple voltage time base generator

6.14. Explain the operation of voltage time base generator

6.15. Draw simple current time base generator

6.16. Explain the operation of current time base generator

6.17. Draw the Bootstrap sweep circuit

6.18. Explain the operation of Bootstrap sweep circuit

6.19. Draw the Miller sweep circuit

6.20. Explain the operation of Miller sweep circuit

6.21. List the applications of Voltage and current Time base circuits.

References

RECOMMENDED BOOKS:

1. Basic Electrical Engineering Volume 1 by PS Dhogal , TMH
2. Electronic devices and applications by B. Somanathan Nair, PHI.
3. Understanding Electronics Components by Filipovic D. Miomir. Mikroe online Edition
4. Electronic Devices and Circuits by David A.Bell Prentice hall

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Suggested Student Activities:

1.Student visits Library to refer to Manual of Electronic Semiconductor Devices to find their specifications

2.Student inspects the available equipment in the Lab to identify the Diodes,Transistors and FETs

3.Visitnearby Industry to familiarize with fabrication techniques of Semiconductor Devices

4.Analyze the Power supply Unit in the Institution facility

5. Participate in the Quiz

6.participate in Group discussion

7. Search internet for Electronic circuits /Projects

Model of rubrics for assessing student activity:

Type of Skill/Score	Excellent(4)	Good(3)	Satisfactory(2)	Developing(1)
Data/Material Collection	All Data/Material was collected one time independently. Collects a great deals of information, all refer to the topic	All Data/Material was collected more than one time independently. Collects more information, most refer to the topic	All Data/Material was collected several times independently. Collects basic information, most refer to the topic	All Data/Material was collected several times with assistance. Collects very limited information, some relate to topic
Methodology / Procedure	Procedures were outlined in a step-by-step fashion that could be followed by anyone without additional explanations.	Procedures were outlined in a step-by-step fashion that could be followed by anyone without additional explanations. Expert help was needed to accomplish this.	Procedures were outlined in a step-by-step fashion, but had 1 or 2 gaps that require explanation even after expert feedback.	Procedures that were outlined were incomplete or not sequential, even after expert feedback had been given.
Activity/ Development	Quality of Skill is high.	Skill is mastered to the level of expectation.	Skill is present but with errors and omissions.	Skill needs improvement.
Interpretation/ summary	Student provided a detailed conclusion clearly.	Student provided a somewhat detailed conclusion clearly.	Student provided a conclusion with some reference.	No conclusion was apparent.
Full-fills team roles and duties	Performs all duties of assigned team roles	Performs almost all duties	Performs nearly all duties	Performs very little duties

Shares work equality	Always does the assigned work, without needing reminding	Always does the assigned work, rarely needs reminding	Usually does the assigned work, rarely needs reminding	Rarely does the assigned work, often needs reminding.
Listen to other team mates	Listens and talks a fare amount	Listens and talks a little more than needed	Listens, but sometimes talk too much	Usually does most of the talking, rarely allows others to speak

e-Links:

1.http://electrical4u.com/

2. www.electronics-tutorials.ws

3. www.nptel.ac.in

CO-PO MAPPING MATRIX

Course Outcome		**CL**	**Linked PO**	**Teaching Hours**
CO1	Construct small signal model of a transistor amplifier and analyze different parameters	R/U	1,2,8,9,10	10
CO2	Apply the basic knowledge of transistor amplifiers and Understand and analyze the working of multi stage and feedback amplifiers and be able to select for proper application	R/U/A	1,2,3,4,8,9,10	10
CO3	Apply the basic knowledge of transistor amplifiers and Understand and analyze the working of tuned and power amplifiers and be able to select for proper application	R/U/A	1,2,5,6,8,9,10	10
CO4	Explain the working of oscillators and be able to select the proper oscillator for the application	R/U/A	1,2,8,9,10	10
CO5	Understand the different special semiconductor devices and be able to select for required application	R/U/A	1,2,5,6,8,9,10	10
CO6	Apply the knowledge of diodes and transistors in designing, constructing regulators and wave shaping circuits	R/U/A	1,2,3,4,6,8,9,10	12

MID SEM EXAMINATIONS

S.No	Unit Name	MID SEM-I EXAM			
		R	U	A	Remarks
1	Unit-I	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-II	3, 4	6(a) 6(b)	8(a) 8(b)	
	Total Questions	4	4	4	
S.No	**Unit Name**	**MID SEM-II EXAM**			
		R	U	A	Remarks
1	Unit-III	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-IV	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

SMESTER END EXAMINATIONS

Sl No	Unit No.	Questions to be set for SEE					Remarks
		R(1 Mark)			U(3 Marks)	A(5 Marks)	
1	I	4	1		9(a)	13(a)	
2	II						
3	III		2		10(a)	14(a)	
4	IV						
5	V		3	5, 6	9(b)	13(b)	
					11(a)	15(a)	
					11(b)	15(b)	
6	VI			7,8	10(b)	14(b)	
					12(a)	16(a)	
					12(b)	16(b)	
Total Questions		8			8	8	

STATE BOARD OF TECHNICAL EDUCATION & TRAINING:TS:HYDERABD

C18EC-303C Electronic Devices and Circuits

III SEMESTER MID SEMESTER – I MODEL PAPER

Time: 1 hour **Max. Marks:20**

PART-A

Answer All questions. Each carries 1 mark. **4X1=4 Marks**

1. Define frequency response of an amplifier?
2. Define h-parameters of a transistor?
3. Classify amplifiers based on coupling?
4. List any two advantages of negative feedback amplifiers over positive feedback amplifiers?

PART-B

Answer ALL questions. Each carries 3 marks. **2X3=6 Marks**

5.a Draw the block diagrams of Voltage shunt feedback and Current series feedback amplifiers?

(OR)

5.b Explain the concept of Gain-Bandwidth product?

6.a Derive the expression for gain in a feedback amplifier?

(OR)

6.b Explain the frequency response of 2-stage RC coupled amplifier

PART-C

Answer ALL questions. Each carries 5 marks. **2X5=10 Marks**

7.a Explain how a BJT in CE mode acts as an amplifier?

(OR)

7.b A transistor used in CE arrangement has the following set of h parameters when the d.c. operating point is VCE = 10 volts and IC = 1 mA : hie = 2000 Ω; hoe =10−4 mho; hre = 10−3 ; hfe = 50 Determine (i) input impedance (ii) current gain and (iii) voltage gain. The a.c. load seen by the transistor is rL = 600 Ω. What will be approximate values using reasonable approximations?

8.a If an amplifier has a bandwidth of 200 KHz and voltage gain of 80.What will be the new bandwidth and gain if 5% negative feedback is introduced ?

(OR)

8.b Two identical amplifier stages having gains of 50 each and phase shift between input and output signals of 180 degrees each are cascaded. How much is the over all gain and phase shift of 2-stage amplifier?

C18EC-303C

STATE BOARD OF TECHNICAL EDUCATION & TRAINING:TS:HYDERABD
C18EC-303C Electronic Devices and Circuits
III SEMESTER MID SEMESTER – II MODEL PAPER

Time: 1 hour **Max. Marks:20**

PART-A

Answer All questions. Each carries 1 marks. **4X1=4 Marks**

1. Define conversion efficiency of a power amplifier?
2. List the applications of Tuned circuits?
3. State Barkhausen criteria in oscillators.
4. What are the advantages of crystal oscillator?

PART-B

Answer ALL questions. Each carries 3 marks. **2X3=6 Marks**

5.a. What is push-pull power amplifier? Why the name is given so?

(OR)

5.b. What is tuned amplifier? Where it is used?

6.a What are the requisites of an amplifier to work as an oscillator?

(OR)

6.b Compare LC and RC oscillators?

PART-C

Answer ALL questions. Each carries 5 marks. **2X5=10Marks**

7.a Calculate the efficiency of a transformer-coupled class A amplifier for a supply of 12 V and outputs outputs of:

(a) V (p) =12V.
(b) V (p) =6V.
(c) V (p) =2V.

(OR)

7.b Calculate the efficiency of a class B amplifier for a supply voltage of VCC = 24 V with peak output voltages of:

(a) (a)VL (p) =22V
(b) (b)VL (p) =6V.

8.a Which oscillator provides stable oscillations? Why?

(OR)

8.b Explain the reasons for instability in oscillators and also mention the remedies?

C18EC-303C

STATE BOARD OF TECHNICAL EDUCATION & TRAINING:TS:HYDERABD
SEMESTER END EXAMINATION MODEL QUESTION PAPER
C18EC-303C Electronic Devices and Circuits

Time: 2 hours **Max. Marks: 40**

PART-A

Answer All questions. Each carries 1 mark. **8X1=8 Marks**

1. Define gain-bandwidth product in an amplifier?
2. What is the need for a heat sink in a power transistor?
3. Draw the symbols of Varactor diode and UJT?
4. Mention Barkhausen criterion in oscillators?
5. List the merits of LCD?
6. List the applications of UJT?
7. Define sweep voltage?
8. Define a non-linear wave shaping circuit?

PART-B

Answer ALL questions. Each carries 3 Marks. **4X3=12 Marks**

9.a Obtain h-parameters of CB configuration in terms of CE configuration?

(OR)

9.b Explain the working principle of LCD?

10.a Distinguish between voltage and power amplifiers?

(OR)

10.b Explain the principle of clamper with waveforms?

11.a Explain the working principle of UJT with its equivalent circuit?

(OR)

11.b Explain the working principle of photo voltaic cell?

12.a Explain the double ended clipper with waveforms?

(OR)

12.b Differentiate voltage time base and current time base circuits?

PART-C

Answer ALL questions. Each carries 5 Marks. **4X5=20 Marks**

13.a Explain how JFET is used as current source?

(OR)

13.b Explain the use of Varactor diode as a tuning element?

14.a Draw and explain the operation of class-B push-pull amplifier and derive the expression for efficiency?

(OR)

14.b Explain the use of Bootstrap Time base generator?

15.a Explain the use of UJT as relaxation oscillator?

(OR)

15.b Explain the principle of operation of Photo transistor and list the application areas of photo transistor?

16.a Explain how a diode clipper is used as noise limiter?

(OR)

16.b Explain the operation of Miller sweep circuit?

ANALOG COMMUNICATION SYTEMS

Course Title :	**ANALOG COMMUNICATION SYSTEMS**	**Course Code**	**18EC-304C**
Semester	**III**	**Course Group**	**Core**
Teaching Scheme in Periods(L:T:P)	**3:1:0**	**Credits**	**3**
Methodology	**Lecture + Assignments**	**Total Contact Hours :**	**60Pds**
CIE	**60 Marks**	**SEE**	**40 Marks**

Rationale: Analog communications is another core subject which forms the basis for Communication Engineering(Wireless). Hence, understanding of Analog Communication is very much essential for an electronics and communication engineering student not only from the industry point of view but also from knowledge perspective as well. Stress is laid on the study of fundamentals of electronic communication. This course serves as a foundation for other advanced electronic communication courses.

Pre requisites

This course requires the basic knowledge of physical sciences at Secondary school level.

Course Outcomes

CO1 :	**Interpret the terminologies of Communication systems.**
CO2 :	**Compare AM ,FM and PM Communication systems.**
CO3 :	**Analyze working of AM and FM Radio transmitters and receivers.**
CO4 :	**Electromagnetic wave propagation concepts.**
CO5 :	**Working principles of various Antennas used in Electronic communication.**
CO6 :	**Problems related to parameters of Analog communication .**

COURSE CONTENT:

UNIT 1 … **Duration : 08 periods**

1.0 Basics of Communication systems.

Elements of a communication system - block diagram- frequency spectrum - frequencies for different applications- modulation- need for modulation in communication systems- amplitude modulation- wave form of an AM wave- Frequency modulation - waveform of FM Wave- phase modulation-

baseband, carrier, and modulated signals - relationship between channel bandwidth, baseband bandwidth and transmission time- causes of distortion in transmission -measures for distortion less transmission- time domain and frequency domain- types of noise- internal and external Noise- signal to noise ratio, noise figure and noise temperature.

UNIT 2 **Duration : 10 periods**

2.0 Analog Modulation Techniques

Time-domain equation for an AM signal- modulation index of an AM signal- frequency spectrum of an AM signal- effects of over modulation- bandwidth of an AM signal- relation between total power and carrier power in AM-Solve simple problems- need for DSBSC and SSB modulation- advantages and disadvantages of SSB- applications of SSB- Vestigial side band transmission-Angle modulation- types of angle modulation- time domain equation for FM signal-modulation index of an FM signal- noise triangle in FM-Comparison of AM , FM and PM- narrow band and wide band FM- pre-emphasis and de-emphasis- need for pre-emphasis and de-emphasis in FM.

UNIT 3 … **Duration : 12 periods**

3.0 Transmitters and Receivers.

Requirements and specifications of transmitters- block diagram for high level modulated transmitter - low level modulated Transmitter -Distinguish between low level and high level modulation- block diagram of basic SSB transmitter - block diagram of indirect FM transmitter (Armstrong method)- block diagram of TRF receiver - limitations of TRF Receiver- need for super heterodyning in radio receiver- working of super heterodyne receiver - block diagram- choice of IF- sensitivity, selectivity and fidelity, image rejection ratio- AVC (AGC)-Explain the process of demodulation in AM receivers- block diagram of FM receiver - Foster-seeley discriminator.

UNIT 4 … **Duration : 10 periods**

4.0 Wave propagation

properties of electromagnetic waves (Absorption, attenuation)- power density and electric field intensity- power density and electric field intensity for waves propagating in free space- polarization of EM waves- vertical and horizontal polarization- characteristic impedance of free space- reflection, refraction, diffraction and interference of EM waves- types of wave propagation methods- ground wave propagation- sky wave propagation- different layers in ionosphere- critical frequency, MUF, skip distance and virtual height in sky wave propagation- space wave propagation- line of sight - expression for LOS- duct propagation- troposphere scatter propagation.

UNIT 5 … **Duration : 10 periods**

5.0 Antennas

Principle of an antenna- radiation pattern- isotropic antenna - radiation pattern- elementary doublet- half wave dipole and give its radiation pattern- power gain, directivity, beam width, radiation resistance- and front to back ratio of an antenna- antenna impedance and polarization- concept of grounding- need for folded dipole- antenna array- operation of broadside and end fire arrays- resonant and non-resonant antennas - construction and working of Rhombic antenna- working of Yagi-Uda

antenna- turnstile antenna- binomial array- principle of parabolic reflector- different feed arrangements- working of Horn and Loop antennas- Helical and Log periodic antenna - applications of dish antenna-antennas used for mobile comm.. and DTH.

UNIT 6 … **Duration :10 periods**

6.0 Engineering Applications.

Problems based on noise, S/N ratio, noise figure, noise temperature, carrier power and total power, bandwidth, modulation index in AM, bandwidth, modulation index in FM , Image Rejection Ratio, power density and electric field intensity at antennas , MUF, Critical frequency in ionosphere propagation, fading- methods of diversity to reduce fading effects, power gain , front to back ratio , design of yagi -uda, loop, helical and dish antennas.

REFERENCE BOOKS:

1. Electronic Communication System by George Kennedy- Bernard DavisTata Mcgraw Hill Education Private Limited
2. Principles Of Electronic Communication Systems by Herbert Taub& Donald L Schilling, 3rd Edition-2009.McGraw Hill Education (India) Private Limited
3. Radio communication by G.K.Mithal- khanna publishers
4. Antennas and Wave propagation by K.D.Prasad- SathyaPrakasahan Publications.
5. Communication Engineering, by Vijayachitra, McGraw Hill Education (India) Private Limited.

Specific Learning Outcomes

On completion of the study of the subject a student should be able to comprehend the following:

1.0 Understand basics of Communication systems.

1.1 Describe the basic elements of a communication system with block diagram.

1.2 Explain frequency spectrum and mention the usage of frequencies for different applications.

1.3 Define modulation.

1.4 State the need for modulation in communication systems.

1.5 Define amplitude modulation.

1.6 Draw the wave form of an AM wave.

1.7 Define Frequency modulation.

1.8 Draw the waveform of FM Wave.

1.9 Define phase modulation.

1.10 Distinguish between baseband, carrier, and modulated signals and give examples.

1.11 Explain the relationship between channel bandwidth, baseband bandwidth and transmission time.

1.12 List causes of distortion in transmission and measures for distortion less transmission.

1.13 Explain the terms time domain and frequency domain.

1.14 Classify different types of noise.

1.15 Distinguish between internal and external Noise.

1.16 Define signal to noise ratio, noise figure and noise temperature.

2.0 Understand the principles of Analogue Modulation Techniques

2.1 Derive the time-domain equation for an AM signal.

2.2 Define the modulation index of an AM signal.

2.3 Draw the frequency spectrum of an AM signal.

2.4 Describe the effects of over modulation.

2.5 Calculate the bandwidth of an AM signal.

2.6 Derive the relation between total power and carrier power in AM.

2.7 Explain the need for DSBSC and SSB modulation.

2.8 List the advantages and disadvantages of SSB.

2.9 List applications of SSB.

2.10 Explain vestigial side band transmission.

2.11 Mention the application of vestigial side band transmission (VSB).

2.12 State the need for angle modulation.

2.13 List two types of angle modulation.

2.14 Derive the time domain equation for FM signal.

2.15 Define the modulation index of an FM signal.

2.16 Discuss noise triangle in FM.

2.17 Compare AM , FM and PM.

2.18 Explain narrow band and wide band FM.

2.19 Define pre-emphasis and de-emphasis.

2.20 Explain the need for pre-emphasis and de-emphasis in FM.

3.0 Understand the working of transmitters and receivers.

3.1 List the requirements and specifications of transmitters.

3.2 Draw the block diagram for high level modulated transmitter and explain

3.3 Draw the low level modulated Transmitter and explain.

3.4 Distinguish between low level and high level modulation.

3.5 Draw the block diagram of basic SSB transmitter.

3.6 Explain the function of each block.

3.7 Draw the block diagram of indirect FM transmitter (Armstrong method& PLL method).

3.8 Explain the function of each block.

3.9 Draw the block diagram of TRF receiver

3.10 Explain the function of each block.

3.11 State the limitations of TRF Receiver.

3.12 Explain the need for super heterodyning in radio receiver.

3.13 Explain the working of super heterodyne AM receiver with a block diagram.

3.14 Explain the choice of IF.

3.15 Define sensitivity, selectivity and fidelity, image rejection ratio.

3.16 Explain the need for AVC (AGC).

3.17 Explain the process of demodulation in AM receivers.

3.18 Draw the block diagram of FM receiver.

3.19 Explain the function of each block.

3.20 Explain Foster-Seeley discriminator (FM demodulator).

4.0 Understand the methods of wave propagation

4.1 Explain the properties of electromagnetic waves (Absorption, attenuation)

4.2 Define power density and electric field intensity

4.3 Calculate power density and electric field intensity for waves propagating in free space.

4.4 Define polarization of EM waves

4.5 Explain vertical and horizontal polarization.

4.6 Define the characteristic impedance of free space.

4.7 Explain reflection, refraction, diffraction, and interference of EM waves.

4.8 List 4 types of wave propagation methods

4.9 Explain ground wave propagation

4.10 Explain sky wave propagation.

4.11 Explain different layers in ionosphere.

4.12 Define the terms critical frequency, MUF, skip distance and virtual height in sky wave propagation.

4.13 Explain space wave propagation.

4.14 Define the term line of sight .

4.15 Give the expression for LOS.

4.16 Explain the methods of diversity to reduce fading effects

4.17 Explain duct propagation.

4.18 Explain troposphere scatter propagation.

5.0 Understand the working Principle of antennas

5.1 Explain the principle of an antenna.

5.2 Define radiation pattern.

5.3 Define isotropic antenna and draw its radiation pattern.

5.4 Explain an elementary doublet.

5.5 Explain half wave dipole and give its radiation pattern.

5.6 Define the terms power gain, directivity, beam width, radiation resistance and front to back ratio of an antenna.

5.7 Explain the terms antenna impedance and polarization.

5.8 State the need for folded dipole.

5.9 State the need of antenna array.

5.10 Explain the operation of broadside and end fire arrays.

5.11 Explain the working of Rhombic antenna.

5.12 Explain the working of Yagi-Uda antenna.

5.13 Explain turnstile antenna.

5.14 Mention the application of turnstile antenna.

5.15 State the need for binomial array.

5.16 Explain the principle of parabolic reflector.

5.17 Explain different feed arrangements.

5.18 Explain the working of Horn and Loop antennas

5.19 Explain the working of Helical antenna .

5.20 Explain the principle of working of mobile antenna.

5.21 Explain the principle of working of DTH antenna.

5.22 List the applications of dish antenna.

6.0 Engineering Applications.

6.1 Simple problems relating to noise, signal to noise ratio, noise figure and noise temperature.

6.2 Simple problems on total power and carrier power in AM systems.

6.3 Simple problems on AM equation and bandwidth of AM systems.

6.4 Simple problems on FM equation and bandwidth of FM systems.

6.5 Problems on Image frequency, Image Rejection Ratio of receivers.

6.6 Problems on power density and electric field intensity of electromagnetic waves.

6.7 Problems on MUF, Critical frequency in ionospheric propagation of EM waves.

6.8 Problems on power gain , front to back ratio in antennas

6.9 Design of yagi-uda antenna for a given TV channel.

6.10 Design of a Loop antenna and list its applications.

6.11 Design a helical antenna and list its applications.

6.12 Design a parabolic antenna.

Suggested Student Activities

1. Student visits Library to refer to wireless communication systems.
2. Student inspects the available equipment in the Lab to identify transmitters and receivers.
3. Visit near by radio stations to familiarize with transmitters characteristics.
4. Prepare a document on different antennas and tabulate the specific details of each / datasheets/ application.
5. Demonstrate Amplitude modulation and demodulation.
6. Demonstrate Frequency modulation and demodulation.
7. Demonstrate / presentation / simulation how Radio works.
8. Prepare/collect animation video of wave propagation and fundamentals of Electromagnetic Waves and give presentation on it.
9. List different wave propagations and give presentation on it.
10. Quiz.
11. Group discussion.
12. Surprise test.

Execution Note:

1. Maximum of 3 students in each batch for student activity
2. Any 3 activities (either from the list given or any similar activities) shall be assigned among Different batches; may be assigned by the teacher based on interest of the students.
3. Project activities shall be carried out throughout the semester and present the project report at the end of the semester; concerned teacher is expected to observe and record the progress of students' activities.
4. Submit qualitative hand-written report not exceeding 5 pages; one report per batch
5. Each of the activity can be carried out off-class well in advance; however, Demonstration / presentation should be done during laboratory sessions.
6. Assessment shall be based on quality of work as prescribed by the following rubrics table

Dimension	Scale					Marks (Example)
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary	
1. Research and gathering information	Does not collect information relate to topic	Collects very limited information, some relate to topic	Collects basic information, most refer to the topic	Collects more information, most refer to the topic	Collects a great deals of information, all refer to the topic	3
2. Full-fills team roles and duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs almost all duties	Performs all duties of assigned team roles	2
3. Shares work equality	Always relies on others to do the work	Rarely does the assigned work, often needs reminding	Usually does the assigned work, rarely needs reminding	Always does the assigned work, rarely needs reminding.	Always does the assigned work, without needing reminding	5
4. Listen to other team mates	Is always talking, never allows anyone to else to speak	Usually does most of the talking, rarely allows others to speak	Listens, but sometimes talk too much,	Listens and talks a little more than needed.	Listens and talks a fare amount	3

Suggested E-Learning references

1.http://electrical4u.com/
2. www.electronics-tutorials.ws
3. www.nptel.ac.in

MID SEM -1 MODEL QUESTION PAPER 18EC-304C

PART- A

Total marks:20

Answer all questions. Each question carries one mark. 1x4=4M

1. Define frequency modulation.
2. Define signal to noise ratio, noise figure.
3. Define modulation index of FM signal.
4. What is meant by narrow band and wide band in Frequency modulation?

PART-B

Answer all questions. Each question carries three marks. 3x2=6M

5.(a) Distinguish between baseband, carrier, and modulated signals and give examples.

OR

5.(b) What are the causes of distortion in transmission?

6.(a) Explain about vestigial side band transmission.

OR

6.(b) Compare AM, FM and PM.

PART-C

Answer all questions. Each question carries five marks. 5x2=10M

7.(a) Explainthe terms time domain and frequency domain.

OR

7.(b) Explain about internal and external noise.

8.(a) Derive the relation between total power and carrier power in Amplitude modulation system.

OR

8.(b) What is meant by pre-emphasis and de-emphasis in Frequency modulation system.

MID SEM -1I MODEL QUESTION PAPER 18EC-304C

PART- A

Total marks:20

Answer all questions. Each question carries one mark. 1x4=4M

1. What is meant by low level modulation?
2. State the need for AVC in a radio receiver.
3. Define polarization of EM waves.
4. Define critical frequency and MUF in sky wave propagation.

PART-B

Answer all questions. Each question carries three marks. 3x2=6M

5.(a) Draw the block diagram of SSB transmitter.

OR

5.(b) Explain the choice of IF in a radio receiver.

6.(a) Briefly explain the sky wave propagation .

OR

6.(b) Briefly explain the duct propagation .

PART-C

Answer all questions. Each question carries five marks. 5x2=10M

7.(a) Draw the low level modulated Transmitter and explain.

OR

7.(b) Draw the block diagram of superheterodyne AM receiver and explain .

8.(a) Explain different layers in atmosphere .

OR

8.(b) Explain space wave propagation (LOS) of EM waves .

SEMESTER END EXAM (SEE) - MODEL QUESTION PAPER 18EC-304C

PART- A

Total marks:40

Answer all questions. Each question carries one mark. 1x8 = 8M

1. Draw the basic communication system block diagram.
2. Define selectivity and fidelity of a radio receiver.
3. What is the need for a folded dipole?
4. Define critical frequency and MUF used in sky wave propogation.
5. Define radiation pattern.
6. What is the need for an antenna array?
7. Calculate bandwidth of a FM wave with frequency deviation of 75KHz and 15KHz modulating frequency.
8. An AM transmitter has a carrier power of 2KW modulated to a depth of 40%. Calculate the transmitter total radiated power.

PART-B

Answer all questions. Each question carries three marks. 3x4=12M

9.(a) Briefly explain the time domain of a signal .

OR

9.(b) Explain the term antenna impedance .

10.(a) Explain the process of demodulation in AM receivers.

OR

10.(b) The signal power at the input to a receiver is 6.2 μ and the noise power at the input to that receiver is 1.8 μW. Find Signal to Noise Ratio in dB. .

11.(a) Explain the operation of an end fire array .

OR

11.(b) Briefly explain function of parabolic reflector .

12.(a) Discuss the applications of loop antenna .

OR

12.(b) Discuss the applications of helical antenna .

PART-C

Answer all questions. Each question carries five marks. 5x4=20M

13.(a) Explain the vestigial side band transmission and mention its application .

OR

13.(b) Explain the working of a Rhombic antenna.

14.(a) Explain how a FM signal is demodulated using discriminator .

OR

14.(b) Design a Yagi – Uda antenna for TV 4th channel..

15.(a) Explain the working of a horn antenna.

OR

15.(b) Explain the working of a turnstile antenna .

16.(a) A modulating signal **$m(t)=10\cos(2\pi\times10^{3}t)$** is amplitude modulated with a carrier signal $c(t)=50\cos(2\pi\times10^{5}t)$. Find the modulation index, the carrier power. (Assume load resistance of antenna to be R_L =1 Ω)

.OR

16.(b) Calculate image frequency rejection ratio (α)for a 1500 KHz carrier signal tuned in an AM receiver with a quality factor of tuned circuit to be 150.

NETWORK ANALYSIS

Course Title :	**Network Analysis**	**Course Code**	**18EC-305C**
Semester	**III**	**Course Group**	**Core**
Teaching Scheme in Periods(L:T:P)	**3:1:0**	**Credits**	**3**
Methodology	**Lecture + Assignments**	**Total Contact Hours:**	**60Pds**
CIE	**60 Marks**	**SEE**	**40 Marks**

Pre requisites :

This course requires the basic knowledge of Basic Physics and Mathematics at Secondary school level

Course Outcomes:

After completion of the course the student should be able to

CO1 :	Solve simple problems related to Ohm's law, KVL and KCL
CO2 :	Apply Mesh current and Node voltage methods to simplify and find solution to electrical circuits
CO3 :	Solve simple problems on DC transients
CO4 :	Design simple passive filters and attenuators for given specifications
CO5 :	Find various two port parameters of simple Two port networks
CO6 :	Apply various Network theorems to simplify and find solution to electrical circuits

Course Content:

Unit 1: Basics of electrical circuits and Kirchoff's laws: Duration:8 Periods (L:5-T:3)

Active and passive elements- resistance, capacitance and inductance parameters- Energy source and classify the energy sources- Ideal voltage source and Ideal current source- Ideal voltage source to ideal current source and vice versa- Introduction to Alternating voltages and currents-Phasor representation of alternating quantities –Phasor relationships for circuit Elements-Impedance and Admittance of circuit elements-AC analysis of series RL,RC circuits.

Unit 2: Mesh current and Node voltage analysis: Duration:12 Periods (L:7-T:5)

Concept of graph of a network - branch, nodes, junction and loop in circuits- Mesh currents- Number of mesh equations required to solve the given Network- Mesh current equations for a given network and arrange them in matrix form-Solve for mesh currents

using Crammer's rule- Nodes in a network- Number of node voltage equations- Node voltage equation for a given network and arrange them in matrix form- Node voltages using Crammer's rule

Unit 3: Transient analysis: Duration:12 Periods (L:7-T:5)

Initial conditions, steady state and transient- DC response for an RL circuit- Expression for current for an RL circuit- DC response for an RC circuit- Expression for current for an RC circuit- DC response for an RLC circuit-Solve simple problems on series RL,RC circuits of DC excitation- RC differentiator circuit - Input/output waveforms for RC differentiator circuit- RC integrator circuit- Input/output waveforms for RC integrator circuit

Unit 4: Filters and Attenuators Duration:8 Periods (L:5-T:3)

Definition of neper, decibel, characteristic impedance, propagation constant, Attenuation- Definition of filter- LPF, HPF, BPF, BSF- Characteristic curves for the above- Expression for characteristic impedance for T and π network- Expression for fc for constant k-LPF, HPF-Design of a simple LPF and HPF for a given cut off frequency and given impedance- Design of a T-type attenuator for the given attenuation and characteristic impedance.- Design of a π-type attenuator for the given attenuation and characteristic impedance- Equalizer circuit-.- Applications of equalizer circuit.

Unit 5: Two port networks: Duration:8 Periods (L:5-T:3)

Definition of port.- Open circuit impedance (Z) parameters with equivalent circuit.- Short circuit admittance(Y) parameters with equivalent circuit-Explain the hybrid (h) parameters with equivalent circuit- Conditions for symmetry in terms of Z,Y, h, parameters- conditions for reciprocity in terms of Z, Y, h, - Z- parameters for a given T-network and Y parameters for a π-network- Inter Relationships of different parameters- Examples for symmetric networks- Examples for Reciprocal networks

Unit 6: Network theorems and Resonance: Duration:12 Periods (L:7-T:5)

Thevenin's, and Norton's theorems - Solve networks- Use of above theorems in electronic circuits- Superposition theorem - Maximum power transfer theorems-Solve simple problems using the above theorem- Importance of impedance matching for maximum power transfer- Reciprocity theorem- Importance of Reciprocity theorem - advantages and limitations of above theorems- Star and Delta configurations of resistances- Formulas from Star to Delta & Delta to Star (no derivation)-Solve simple problems on Star/Delta and Delta/Star transformation. Resonance in A.C. Circuits - Series and parallel resonance. - curves, effect of resistance on Q factor selectivity and bandwidth.

Suggested Learning Outcomes:

After completing the course student will be able to

1.0 Basics of electrical circuits and Kirchhoff's laws

1.1 Define active and passive elements.
1.2 Define energy source and classify the energy sources.
1.3 Explain ideal voltage source and ideal current source
1.4 Convert ideal voltage source to ideal current source and vice versa.
1.5 Explain Phasor representation of sinusoids.
1.6 Derive the expression for I,Z, and power in an R-L series circuit.
1.7 Draw the vector and phasor diagrams for the above.
1.8 Derive the expression for I,Z, and power in an R-C series circuit.
1.9 Draw the vector and phasor diagrams for the above.
1.10 Derive the expression for I,Z, and power in an R-L-C series circuit.
1.11 Draw the vector and phasor diagrams for the above.
1.12 Explain the methods for solving parallel circuits.

2.0 Mesh current analysis and Node voltage analysis

2.1 Explain the concept of graph of a network
2.2 Define, branch, nodes, junction and loop in circuits.
2.3 Identify the mesh currents.
2.4 Determine the number of mesh equations required to solve the given Network
2.5 Write the mesh current equations for a given network and arrange them in matrix form.
2.6 Solve for mesh currents using Crammer's rule.
2.7 Identify the nodes in a network.
2.8 Determine the number of node voltage equations.
2.9 Write the node voltage equation for a given network and arrange them in matrix form.
2.10 Solve for node voltages using Crammer's rule.
2.11 Explain duality of a network
2.12 Draw the dual of given network.
2.13 Explain the concept of graph of a network

3.0 Transient analysis.

3.1 Define the terms initial conditions, steady state and transient.
3.2 Explain the dc response for an RL circuit.
3.3 Derive expression for current for an RL circuit.
3.4 Explain the dc response for an RC circuit.
3.5 Derive expression for current for an RC circuit.
3.6 Explain the dc response for an RLC circuit.
3.7 Solve simple problems on series RL, RC circuits of DC excitation.
3.8 Explain RC differentiator circuit
3.9 Draw input/output waveforms for RC differentiator circuit

3.10 Explain RC integrator circuit
3.11 Draw input/output waveforms for RC integrator circuit

4.0 Filters and attenuators

4.1 Define neper, decibel, characteristic impedance, propagation constant, Attenuation
4.2 Define filter, LPF, HPF, BPF, BSF.
4.3 Draw the characteristic curves for the above
4.4 Derive the expression for characteristic impedance for T and π network.
4.5 Give the expression for fc for constant k-LPF, HPF.
4.6 Design a simple LPF and HPF for a given cut off frequency and given impedance.
4.7 Design a T-type attenuator for the given attenuation and characteristic impedance.
4.8 Design a π-type attenuator for the given attenuation and characteristic impedance.
4.9 Define the equalizer circuit
4.10 Draw the circuit of equalizer circuit.
4.11 List the applications of equalizer circuit.

5.0 Two port networks

5.1 Define port.
5.2 Explain the open circuit impedance (Z) parameters with equivalent circuit.
5.3 Explain the short circuit admittance(Y) parameters with equivalent circuit.
5.4 Explain the hybrid (h) parameters with equivalent circuit.
5.5 Give the conditions for symmetry in terms of Z, Y, h parameters.
5.6 Give conditions for reciprocity in terms of Z, Y, h parameters
5.7 Find the Z- parameters for a given T- network and Y parameters for a π-network
5.8 Express Z- parameters in terms of Y- parameters
5.9 Express Y- parameters in terms of Z- parameters
5.10 Give Examples for symmetric networks
5.11 Give Examples for Reciprocal networks

6.0 Network theorems and Resonance

6.1 State Thevenin's and Norton's theorem.
6.2 Apply the above theorems to solve networks.
6.3 Explain the use of above theorems in electronic circuits
6.4 State superposition theorem
6.5 Solve simple problems using the above theorem
6.6 State Maximum power transfer theorem.
6.7 Solve simple problems using the above theorem.
6.8 Explain the importance of impedance matching for maximum power transfer.
6.9 State Reciprocity theorem
6.10 Explain the importance of Reciprocity theorem by giving examples like Co axial cable and flat twin lead cable used in Television systems.
6.11 List the advantages and limitations of above theorems.
6.12 Explain star and Delta configurations of resistances.
6.13 Give transformation formulas from Star to Delta & Delta to Star (no derivation).
6.14 Solve simple problems on Star/Delta and Delta/Star transformation.

6.15 Explain resonance in RLC series circuit
6.16 Derive the formula for series resonance
6.17 State the conditions for series resonance
6.18 Define bandwidth of a resonant circuit
6.19 Define lower cut off and upper cut off frequencies
6.20 Give formula for lower cut off and upper cut off frequencies
6.21 Solve simple problems on series Resonance.
6.22 Explain Resonance in parallel circuits
6.23 State the conditions required for parallel resonance
6.24 Derive Equation for resonant frequency.
6.25 Compare Series and parallel resonance
6.26 Solve problems on Resonance
6.27 Explain effect of Resistance on Bandwidth.

RECOMMENDED BOOKS

1. Engineering circuit analysis by W.H.Hayt, J.E.Kemmerly and S.M.Durbin, Tata Mc Graw Hill, New Delhi.
2. Fundamentals of Electric circuits by Charles K. Alexander and Matthew N.O. Sadiku,
   Mc Graw Hill publishers.
3. Network Analysis by M.E Van Valkenberg, Prantice Hall India, 3rd Edition
4. Electric Circuits -Joseph Edminister ,Schaum Series publishers.

Suggested E-Learning references

1. www.allaboutcircuits.com
2. http://electrical4u.com
3. www.electronics-tutorials.ws
4. www.nptel.ac.in

Suggested Student Activities

1. Participate in the Quiz
2. participate in Group discussion
3. Search internet for more literature.
4. . Surprise test.

Suggested Model Rubrics

CATEGORY	Needs improvement	Satisfactory	Good	Excellent
Organization of presentation	Hard to follow; sequence of information jumpy	Most of information presented in sequence	Information presented in logical sequence; easy to follow	Information presented as interesting story in logical, easy to follow sequence
Background content	Material not clearly related to topic OR background dominated seminar	Material sufficient for clear understanding but not clearly presented	Material sufficient for clear understanding AND effectively presented	Material sufficient for clear understanding AND exceptionally presented
Knowledge of subject	Does not have grasp of information; answered only rudimentary questions	At ease with information; answered most questions	At ease; answered all questions but failed to elaborate	Demonstrated full knowledge; answered all questions with elaboration
Eye Contact	Reads most slides; no or just occasional eye contact	Refers to slides to make points; occasional eye contact	Refers to slides to make points; eye contact majority of time	Refers to slides to make points; engaged with audience
Pace	Rushed OR dragging throughout	Rushed OR dragging in parts	Most of the seminar well paced	Well-paced throughout

CO-PO MAPPING MATRIX

Course Outcome		CL	Linked PO	Teaching Periods
CO1	Solve simple problems related to Ohm's law, KVL and KCL	R/U/A	1,2,10	**8**
CO2	Apply Mesh current and Node voltage methods to simplify and find solution to electrical circuits	R/U/A	1,2,5,6,7	**12**
CO3	Solve simple problems on DC transients	R/U/A	1,2,9	**12**
CO4	Design simple passive filters and attenuators for given specifications	R/U/A	1,2,5,7	**8**
CO5	Find various two port parameters of simple Two port networks	R/U/A	1,2,5	**8**
CO6	Apply various Network theorems to simplify and find solution to electrical circuits Design simple passive filters and attenuators for given specifications	R/U/A	1,2,3,7	**12**

MID SEM EXAMINATIONS

S.No	Unit Name	MID SEM-I EXAM			
		R	U	A	Remarks
1	Unit-I	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-II	3, 4	6(a) 6(b)	8(a) 8(b)	
	Total Questions	4	4	4	
S.No	**Unit Name**	**MID SEM-II EXAM**			
		R	U	A	Remarks
1	Unit-III	1, 2	5(a) 5(b)	7(a) 7(b)	
2	Unit-IV	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

SMESTER END EXAMINATIONS

Sl No	Unit No.	Questions to be set for SEE					Remarks
		R(1 Mark)			U(3 Marks)	A(5 Marks)	
1	I	4	1		9(a)	13(a)	
2	II						
3	III		2		10(a)	14(a)	
4	IV						
5	V		3	5, 6	9(b)	13(b)	
					11(a)	15(a)	
					11(b)	15(b)	
6	VI			7,8	10(b)	14(b)	
					12(a)	16(a)	
					12(b)	16(b)	
Total Questions		8			8	8	

Model Paper for Mid-I,

BOARD DIPLOMA EXAMINATION, (C-18)

III SEMESTER, 18 EC-305C

NETWORK ANALYSIS

Time :**1** Hr Total Marks :20Marks

PART-A

Answer **all** questions,each carries **one** marks 4 X 1 = 4

1. Define Active and Passive elements.
2. Define Impedance.
3. Define branch and node.
4. Define admittance.

PART-B

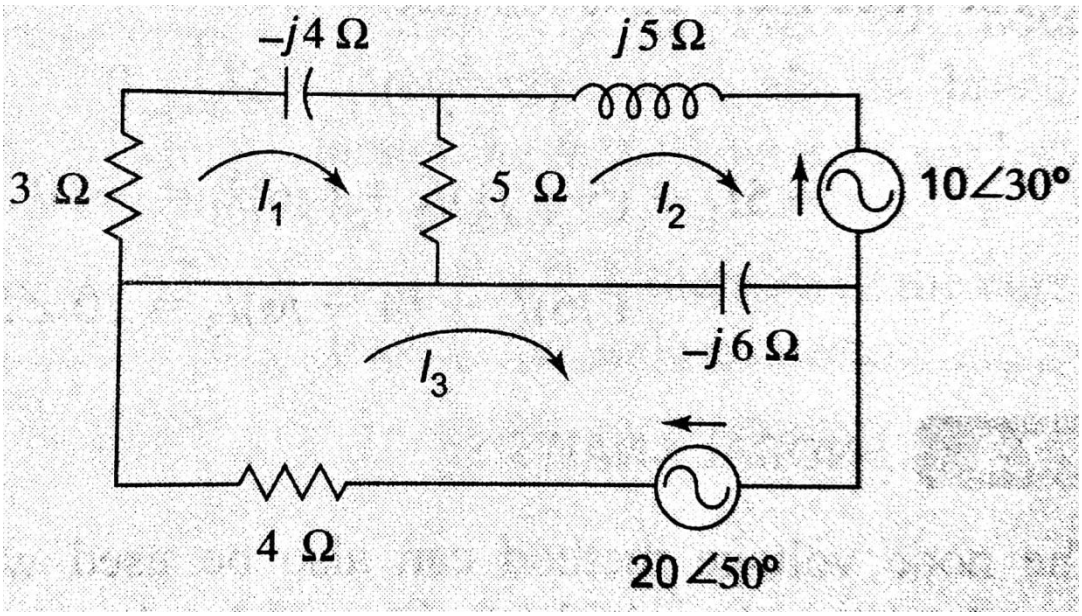
Answer **all** questions,each carries **three** marks 2 X 3 = 6

5. a) Explain Importance of sinusoid as an AC forcing function

OR

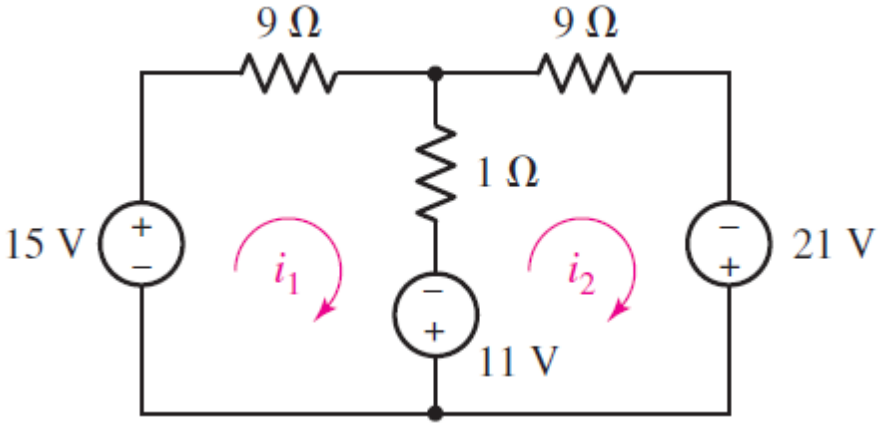
b) Derive relationship between phasor voltage across and phasor current through an inductor.

6. a) For the given circuit write the mesh equations in matrix form and find the value of I_1.



OR

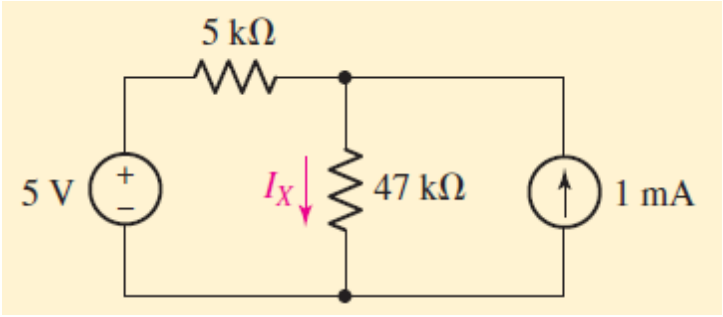
b) find the mesh currents in the given circuit.



PART-C

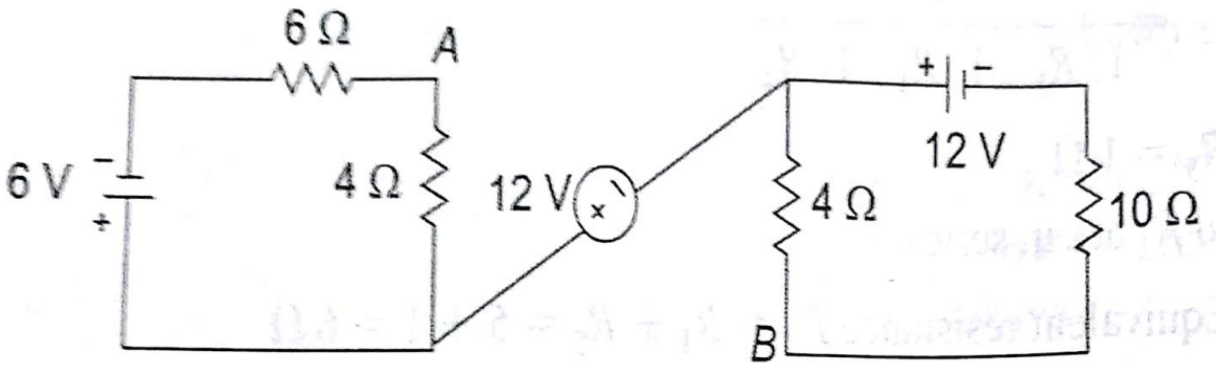
Answer any **all** questions, each carries **five** marks 2 X 5 = 10

7. a) Apply source transformation technique to find out current flowing through 47 kΩ resistor

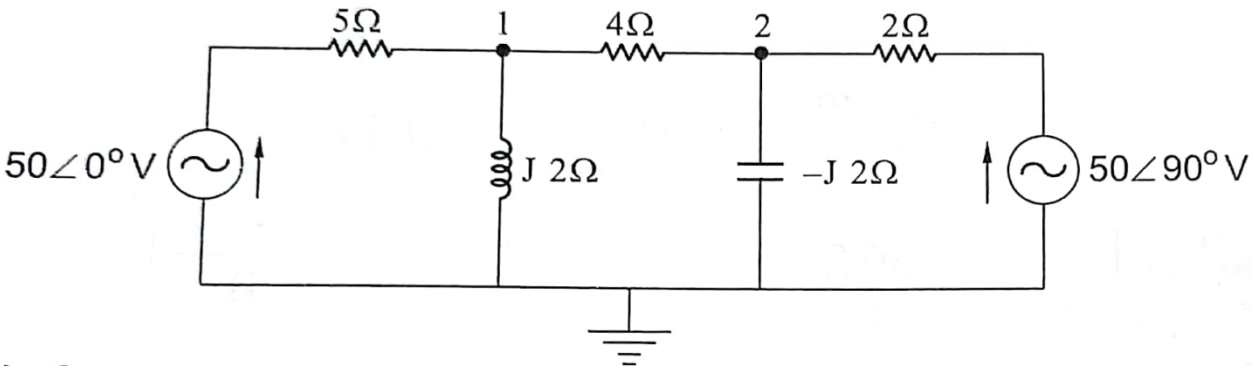


OR

b) Apply KVL to find the voltage between points A and B in the given circuit.

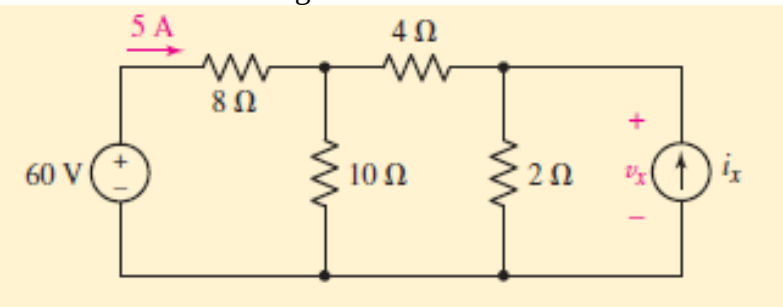


8. a) Find the voltages at node1 and node2 by using node analysis



OR

b) Determine the value of v_x in the given circuit.



Model Paper for Mid-II,

BOARD DIPLOMA EXAMINATION, (C-18)

III SEMESTER, 18 EC-305C

NETWORK ANALYSIS

Time :**1** Hr Total Marks:20Marks

PART-A

Answer **all** questions, each carries **one** marks 4 X 1 = 4

1. Define time constant of RL circuit and mention its units.
2. Draw RC integrator circuit.
3. Define characteristic impedance.
4. List the applications of equalizers.

PART-B

Answer any **all** questions, each carries **three** marks 2 X 3 = 6

5. a) Explain the transient analysis of RC circuit for DC excitation.

OR

b) Explain about RC differentiator circuit

6. a) Derive expression for characteristic impedance of symmetrical π network.

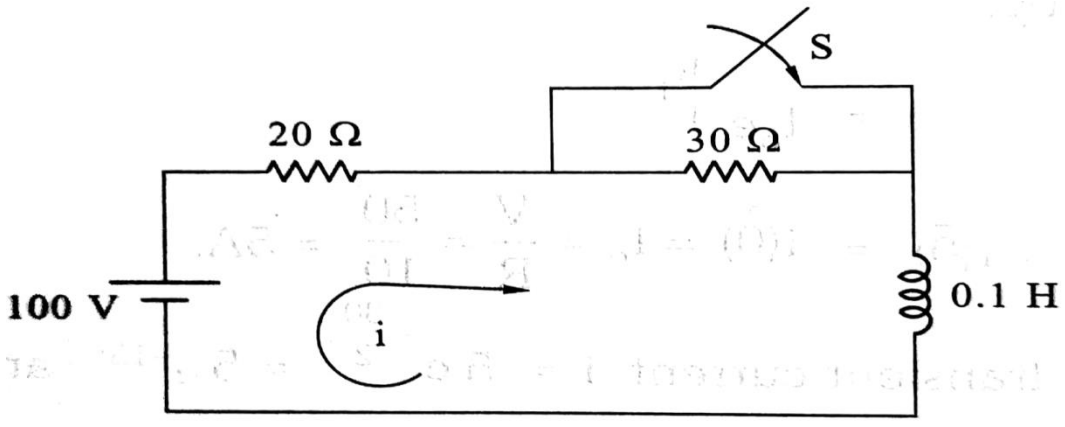
OR

b) Derive the design formulas for constant K low pass filter.

PART-C

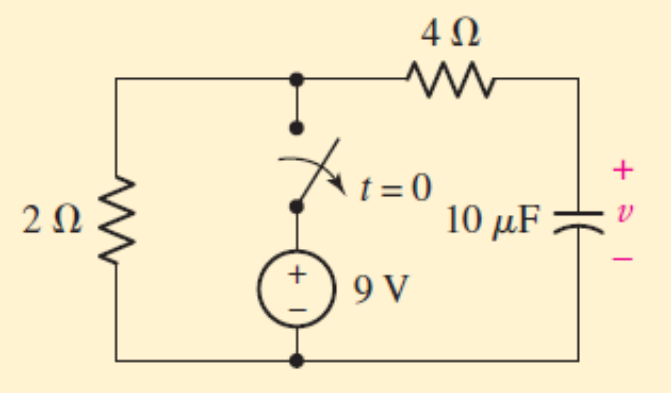
Answer any **all** questions, each carries **five** marks 2 X 5 = 10

7. a) For the circuit shown find the complete expression for current when the switch is closed at time t = 0.



OR

b) Find the voltage across the capacitor at time t = 200 μs.



8. a) Design a high pass filter having a cutoff frequency of 1 kHZ with a load resistance of 600Ω.

OR

b) Derive the expression for the cutoff frequency f_c for constant K high pass filter.

Model Paper for SEE

BOARD DIPLOMA EXAMINATION, (C-18)

III SEMESTER, 18 EC-305C

NETWORK ANALYSIS

Time :**2**Hrs Total Marks : 40Marks

PART-A

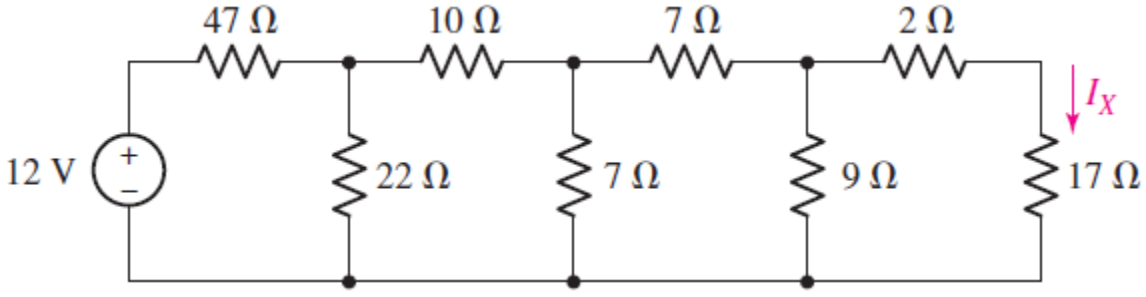
Answer **all** questions, each carries **one** marks 8 X 1 =8

1. Mention the limitations of Ohm's Law.
2. Define time constant of RC circuit and mention its units.
3. List the applications of equalizers.
4. State the conditions for symmetry and reciprocity for Z parameters.
5. Define two-port network.
6. Mention the limitations of superposition theorem.
7. State the condition for resonance in series RLC circuit.
8. State Maximum power transfer theorem for DC load.

PART-B

Answer any **all** questions, each question carries **three** marks 4 x 3 = 12

9. a) Applying repeated source transformation convert the given circuit into a single voltage source and a resistance.



OR

b) Explain about Y parameters and draw its equivalent circuit model.

10. a) Explain the transient analysis of RL circuit for DC excitation.

OR

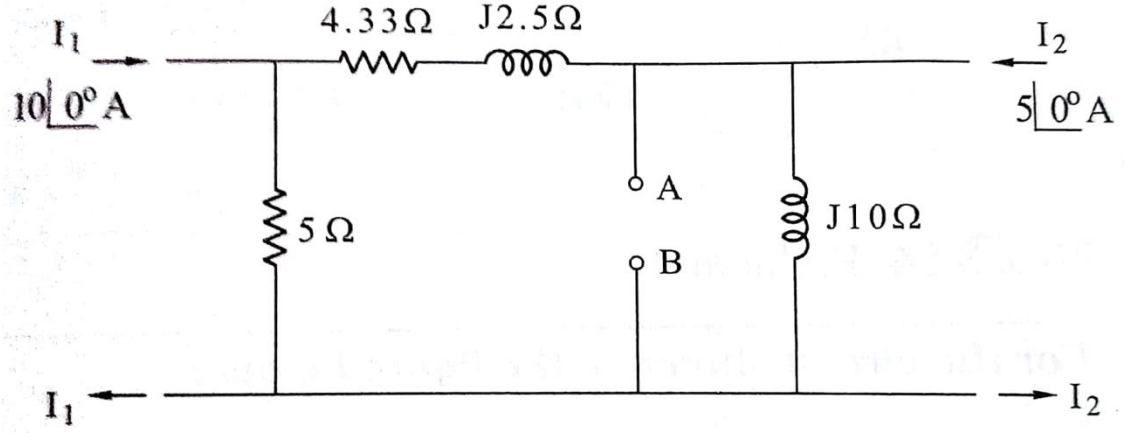
b) Explain about resonance in parallel RLC circuit

11. a) Derive the expressions for Z parameters in terms of Y parameters.

OR

b) Explain about open circuit impedance (Z) Parameters with equivalent circuit.

12.a) Find the Norton's equivalent between points A and B.



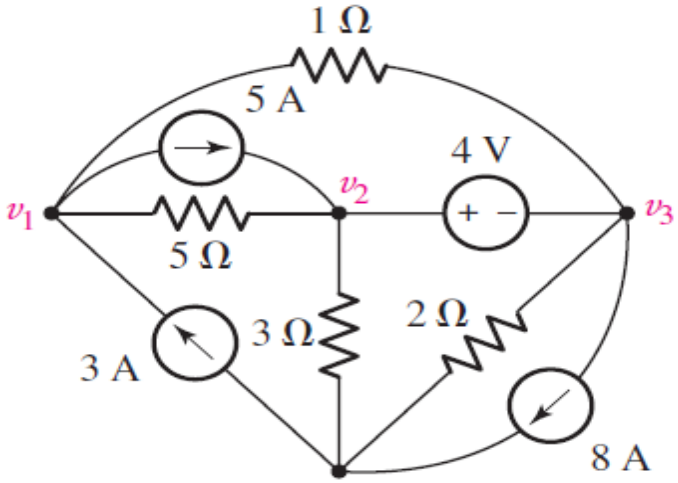
OR

b) Explain the effect of resistance on bandwidth of a series RLC circuit

PART-C

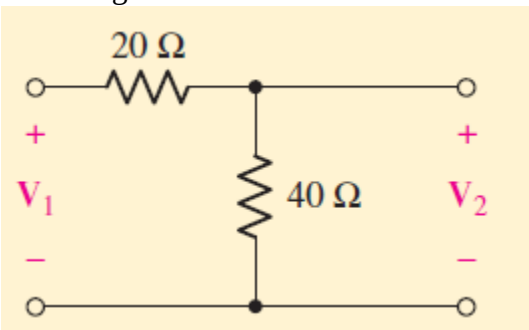
Answer any **all** questions, each question carries **five** marks 4 x 5 = 20

13.a) Apply super node analysis to find the values of v_1, v_2 and v_3 in the given circuit.



OR

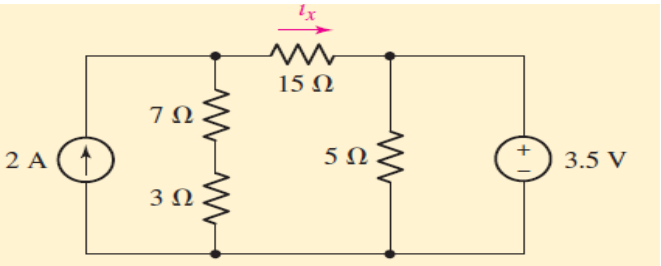
b) Find the h parameters of the given circuit.



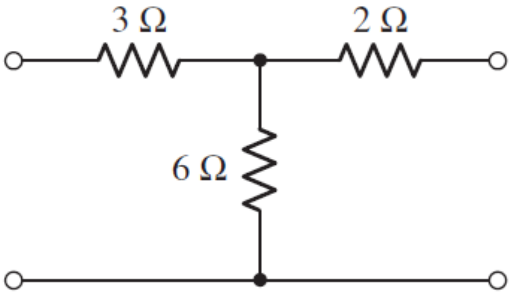
14. a) Derive the expression for the cutoff frequency f_c for constant K low pass filter.

OR

b) Apply superposition theorem to find the value of i_x.



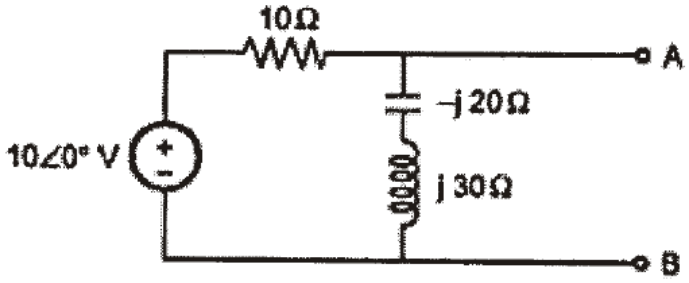
15. a) Find the Z parameters for the given network.



OR

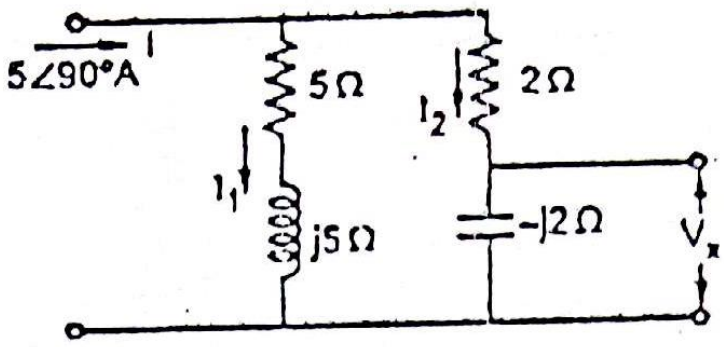
b) Derive the expressions for Y parameters in terms of Z parameters

16. a) Find the value of load impedance required to be connected across the terminals A-B for maximum power transfer, in the network shown below. Also find the maximum power delivered to load



OR

b) Verify reciprocity theorem for the given network



ELECTRONIC DEVICES LAB PRACTICE

Course Title :	**Electronic Devices Lab Practice**	Course Code	18**EC-306P**
Semester	**III**	Course Group	**Core**
Teaching Scheme in Periods(L:T:P)	**1:0:2**	Credits	**1.5**
Methodology	**Lecture + Practicals**	Total Contact Periods :	**45**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

This course requires the basic skills of Handling Basic Electronics tools and Components, knowledge of connecting cables and meters

Course Contents

I. Amplifiers and Oscillators

1. Implement voltage divider bias single stage RC coupled CE amplifier and plot frequency response.

   a) Observe the effect of connecting and disconnecting the emitter bypass capacitor on gain and distortion.

   b) Observe the effect of emitter bypass capacitor Ce on voltage across Emitter Resistance using CRO.

   c) Measure the output power using ac power meter

2.Implement Colpitt's oscillator and verify the effect of Varying the tank circuit component values and observe output waveforms on CRO.

3.Implement Hartley oscillator and verify the effect of Varying the tank circuit component values and observe output waveforms on CRO.

4. Implement transistor Astable multivibrator circuit and observe the waveforms on CRO.

II. Special Semiconductor Devices

5. Plot the characteristics of a) Photodiode b) photo transistor

6.a) Implement a Twilight switch using a Phototransistor and a Relay

   b) Replace Phototransistor with LDR and Test

7. a)Plot the VI characteristics of different color LEDs & determine the Vf (forward voltage drop)

b) Test the above devices with DMM & Analogue multimeter and identify the Terminals

8.a) Plot the characteristics of i) LDR ii) Thermistor iii) VDR

b) Test the above devices with DMM & Analogue multimeter

9. a)Implement a simple Temperature controller using Thermistor and a Relay

b)Use a VDR /Trigistor for protection against high voltage surges and verify

10. a)Plot the characteristics of optocoupler MCT2E

b) Test the given optocoupler and identify its terminals

11. a)Use MCT 2E to switch on a 6V lamp connected to RPS by applying a Low voltage 1.5 V signal from a cell at input

b) Implement a simple timer using 1 M Ω Resistor , 1000 mfd capacitor ,Transistor BC148 and a Relay

III. Wave shaping Circuits

Realize Clipper and Clamper circuits and observe the waveforms on CRO

12. a)Realize Series and Parallel diode clippers

b) Assemble and test Positive and negative clipper circuits with and without bias

13. a) Implement Amplitude limiter (two diodes connected back to back) and observe the waveform on CRO.

b) Implement a Zener diode Clipper and measure the output voltage with DMM and also observe waveform on CRO

14. Implement Boot-strap sweep circuit and observe the sweep wave form.

15. Implement Miller sweep circuit and observe the waveform.

Suggested Student Activities

(i) Collection of catalogues and specification sheets, preparation of a chart displaying symbols of passive components and connectors/cables.

(ii) Collection of the contributors (scientists) and contribution details to the field of Electrical and Electronics engineering

(iii) Any other such activities that can contribute to the student's knowledge in respect of this course.

(iv)Record the best practices used in the disposal of E-waste and precautions in the operation of electrical appliances.

Course Outcome		Linked PO	
CO1	Apply the basics of transistor to construct amplifiers, oscillators and multi-vibrators and analyze the effect of circuit components	1,2,3,8,9,10	12
CO2	Identify different special semiconductor devices and apply the knowledge of special semiconductor devices in special applications	1,2,3,4,5,6,8,9,10	18
CO3	Apply the knowledge of semiconductor components in realizing and analyzing wave shaping circuits	1,2,3,4,8,9,10	15
			45

E Learning Resources

1.http://electrical4u.com/

2. www.electronics-tutorials.ws

3. www.nptel.ac.in

4.studentboxoffice.in

State Board of Technical Education and Training,Telangana

III Semester Mid Examination-I Model Question paper

DECE III semester practical Examination

Corse Code:18EC-306P **Duration:2 hours**

Course Name: Electronic Devices Lab Practice
Max.Marks:20

Instructions to the Candidate:

(i)Answer any One of the following Questions.

(ii)Record the results on a graph sheet if required , and conclude your observation of the experiment

(iii) Draw the circuit diagram for illustration ,choose appropriate values when not mentioned in the question

1. Implement voltage divider bias single stage RC coupled CE amplifier and plot frequency response. Record the effect of emitter bypass capacitor on gain of the amplifier.
2. Implement Colpitt's oscillator and verify the effect of Varying the tank circuit component values and observe output waveforms on CRO.
3. Implement Hartley oscillator and observe the effect of Varying the tank circuit component values and observe output waveforms on CRO. Record your observations.
4. Implement transistor Astable multivibrator circuit and observe the waveforms on CRO and record your observations.
5. Implement the Photo diode circuit to show that the resistance of the photo diode varies with light and also measure the current through the Photodiode. Record your observations.

State Board of Technical Education and Training,Telangana

III Semester Mid Examination-II <u>Model</u> Question paper

<u>DECE III semester practical Examination</u>

Corse Code:18EC-306P **Duration:2 hours**

Course Name: Electronic Devices Lab Practice
Max.Marks:20

<u>Instructions to the Candidate:</u>

(i)Answer any <u>One</u> of the following Questions.

(ii)Record the results on a graph sheet if required , and conclude your observation of the experiment

(iii) Draw the circuit diagram for illustration ,choose appropriate values when not mentioned in the question

1. .Implement the Photo transistor circuit to show that the resistance of the photo transistor varies with light and also measure the current through the Photo transistor. Record your observations.

2.a) Implement a Twilight switch using a Phototransistor and a Relay

b) Replace Phototransistor with LDR and record the observations.

3. a)Plot the VI characteristics of white, red and green color LEDs & determine the Vf (forward voltage drop)

b) Test the above devices with DMM & Analogue multimeter and identify the Terminals

4.a) Plot the V-I characteristics and response characteristics of i) LDR

b) Test the above devices with DMM & Analogue multimeter

5. a)Implement a simple Temperature controller using Thermistor and a Relay

b)Use a VDR for protection against high voltage surges and verify

State Board of Technical Education and Training,Telangana

Semester End Examination Model Question paper

DECE III semester practical Examination

Corse Code:18EC-306P **Duration:3 hours**

Course Name: Electronic Devices Lab Practice
Max.Marks:40

Instructions to the Candidate:

(i)Answer any One of the following Questions.

(ii)Record the results on a graph sheet if required , and conclude your observation of the experiment

(iii) Draw the circuit diagram for illustration ,choose appropriate values when not mentioned in the question

1. Implement voltage divider bias single stage RC coupled CE amplifier and plot frequency response. Record the effect of emitter bypass capacitor on gain of the amplifier.

4. Implement Colpitt's oscillator and verify the effect of Varying the tank circuit component values and observe output waveforms on CRO.

5. Implement Hartley oscillator and observe the effect of Varying the tank circuit component values and observe output waveforms on CRO. Record your observations.

4. Implement transistor Astable multivibrator circuit and observe the waveforms on CRO and record your observations.

5. Implement the Photo diode circuit to show that the resistance of the photo diode varies with light and also measure the current through the Photodiode. Record your observations.

6. .Implement the Photo transistor circuit to show that the resistance of the photo transistor varies with light and also measure the current through the Photo transistor. Record your observations.

7.a) Implement a Twilight switch using a Phototransistor and a Relay

b) Replace Phototransistor with LDR and record the observations.

8. a)Plot the VI characteristics of white, red and green color LEDs & determine the Vf (forward voltage drop)

b) Test the above devices with DMM & Analogue multimeter and identify the Terminals

9.a) Plot the V-I characteristics and response characteristics of i) LDR

b) Test the above devices with DMM & Analogue multimeter

10. a)Implement a simple Temperature controller using Thermistor and a Relay

b)Use a VDR for protection against high voltage surges and verify

11. a)Plot the characteristics of optocoupler MCT2E

b) Test the given optocoupler and identify its terminals

12. a) Use MCT 2E to switch on a 6V lamp connected to RPS by applying a Low voltage 1.5 V signal from a cell at input b) Implement a simple timer using 1 M Ω Resistor , 1000 mfd capacitor ,Transistor BC148 and a Relay

13. Construct and test Positive and negative clipper circuits with and without bias

14. Implement Amplitude limiter (two diodes connected back to back) and observe the waveform on CRO.

b) Implement a Zener diode Clipper and measure the output voltage with DMM and also observe waveform on CRO

15. Implement Boot-strap sweep circuit and observe the sweep wave form.

NETWORK ANALYSIS AND ANALOG COMMUNICATION LAB PRACTICE

Course Title :	**ANALOG COMMUNICATION LAB PRACTICE**	**Course Code**	**18EC-307P**
Semester	**III**	**Course Group**	**Core**
Teaching Scheme in Periods(L:T:P)	**1:0:2**	**Credits**	**1.5**
Methodology	**Lecture + Practical**	**Total Contact Hours :**	**45Pds**
CIE	**60 Marks**	**SEE**	**40 Marks**

Pre requisites

Knowledge of networks theorems and analog communication basic concepts.

Course outcomes

Course Outcome		Linked PO
CO1	**Understand and prove the network theorems on a given network**	**1,2,3,4,5,,7,8,9**
CO2	**Hands on experience using measuring equipment and CRO**	**1,2,3,4,8,9**
CO3	**Observe and study waveforms of AM and FM radio systems**	**1,2,3,4,8,9,10**
CO4	**Observe and study waveforms of pulse shaping and filter networks and demonstrate principles of Resonance.**	**1,2,3,10**

LIST OF EXPERIMENTS:

I. Verification of Network theorems

1. A) Verify Thevenin's theorem.

   B) Determine the Thevenin's Resistance of a Potential divider network.

   C) Verify Norton's theorem

2. A) Verify Super position theorem.

   B) Verify Maximum power transfer theorem.

   C) Connect Four 4 ohms speakers to obtain 4 Ohms Impedance and test for maximum power output by Audio amplifier at 4 ohms output terminals.

II. Electronic measuring equipment

3. Measure the component values using special equipment

A) Use DMM/ Multimeter to measure DC current , AC Current,Beta of transistor

B) Use the AC bridge/Digital LCR meter to measure Resistance , Inductance , capacitance and Q

III. Measurements using CRO

4. Familiarize with CRO front panel controls and observe the effect of different settings

A) Set intensity , Astigmatism and Focus controls to display i)Medium frequency ii) Low frequency iii) High frequency.

B) Apply different waveforms using function generator and produce flicker free waveforms.

C) Set the output of function generator to desired amplitude and frequency (say 20 milli volts and 1.5 khz) by observing on CRO.

5. **Determine Vertical and Horizontal deflection sensitivity of CRO by applying standard signal provided on CRO**

A) Observe the effect of Trigger control on the waveform and display the waveform from the set point.

B) Measure signal amplitude using x10 CRO probe.

6. **Use dual mode for simultaneous observation of two signals.**

A) Use ADD mode observe the resultant wave form

B) Measure the Time period and frequency of a signal in Time base multiplier mode.

7. A) work with various controls on Digital CRO

B) Practice with i) Manual measurements ii) Cursor measurements iii) Automatic measurements By repeating sub experiments in experiment number 4& 5 .

C) Observe charging and discharging curves of a capacitor using digital CRO and determine time constant of given RC circuit.

IV. Modulation & Demodulation Techniques

8. A) implement and observe AM signal and determine Modulation index using CRO

   i) Using Envelop method

   ii) Trapezoidal Pattern method

   iii) observe the effect of Over modulation and under modulation

   B) Implement diode demodulator circuit and observe the detected waveform

9. Identify different sections in AM/FM radio receiver.

   B) Observe the different types of inductors used in the radio tuned circuits.(Local oscillator coils, IFT coils, Ferrite cored)

10. Generate FM signal and determine Modulation index

    A) Demodulate F.M signal and compare the output signal with original modulating signal. .

V. Pulse and wave shaping circuits

11. A) Measure the Rise time, Fall time , duty cycle, Pulse width, Pulse amplitude , overshoot of Pulse on CRO

    B) Observe the effect of Offset control on function generator on output waveform

12. A) Design and implement RC integrator circuit

    B) apply a square wave and observe the output waveform on CRO.

    C) use a differentiator circuit to convert a long Push button trigger signal into a pulse for use in Timer circuits

    D) Use integrator circuit for producing triangular wave / Ramp

    E) Design a Low pass filter Using Integrator circuit for a given cut off frequency

    F) Design a High pass filter Using Differentiator circuit for a given cut off frequency.

13. Realize Clipper and Clamper circuits and observe the waveforms on CRO

    A) Realize Series and Parallel clippers

B) Assemble Positive and negative clipper circuits with and without bias

C) Connect a Zener diode in place of diode and measure the output voltage with DMM and also observe waveform on CRO

D) Realize a Clamper circuit and observe the input and output waveforms on CRO.

V. Resonance & Filters

14. Plot resonant curves of a tuned circuit

A) Series Resonance. b) Parallel Resonance. C) Wind a small coil and determine its inductance.

15. Design and construct constant K filters of 1st order

A) Design and implement a Low pass filter with a cut off frequency of 10 khz(or any other frequency) and evaluate the performance.

B) Design and implement a High pass filter with a cut off frequency of 10 khz (or any other frequency) and evaluate the performance.

E-Learning:

1.http://electrical4u.com/

2. www.electronics-tutorials.ws
3. www.nptel.ac.in

QUESTION BANK

1. Verify Thevenin's theorem for a given network.
2. Verify Nortorn,s theorem for a given network.
3. Verify Maximun power transfer theorem for a given network.
4. Verify superposition theorem for a given network.
5. Using a DMM measure DC voltages, AC voltages of a given active network and values of given resistances verify them with their color codes.
6. Using a digital LCR meter measure the values of given resistances, capacitances and inductors and the quality factor of a coil.
7. Using a CRO find out the amplitude and frequency values of a given waveform derived from a AF /RF generating instrument.
8. Calculate time period and frequency of a given pulse wave form derived from pulse generator.
9. Observe the charge and discharge curves of using a digital CRO, determine the time constant of a given RC circuit.
10. Observe an AM signal through a CRO and find out the modulation index using envelope method.

11. Obtain a AM detected signal through a CRO using an AM detector and find out its frequency and amplitude.
12. Identify the various sections of AM receiver and observe different types of inductors used in tuned circuits like RF , IF and AF amplifiers.
13. Identify the various sections of FM receiver and observe different types of inductors used in tuned circuits like RF , IF and AF amplifiers.
14. Observe a FM signal through CRO and find out its modulation index.
15. Demodulate F.M signal and compare the output signal with original modulating signal using a CRO.
16. Measure the Rise time, Fall time, duty cycle, Pulse width, Pulse amplitude , overshoot of a given Pulse on CRO.
17. Observe and sketch the waveform of a given RC differentiator network being driven by a pulse (pulse width t_d) under the following conditions. 1) **RC>> t_d 2) RC<< t_d 3) RC=t_d**
18. Observe and sketch the waveform of a given RC integrator network being driven by a pulse (pulse width t_d) under the following conditions of time constants. 1) **RC>> t_d 2) RC<< t_d 3) RC=t_d .**
19. Demonstrate the use of integrator circuit for producing triangular wave / Ramp through a square wave using a CRO.
20. Design a Low pass filter using a given Integrator circuit (RC) for a given cut off frequency say 1KHz.
21. Design a Low pass filter using a given Integrator circuit (RC) for a given cut off frequency say 2KHz.
22. Realize a series clipper and observe the waveform on a CRO.
23. Realize a parallel clipper and observe the waveform on a CRO.
24. Realize a positive clipper without bias and observe the waveform on a CRO.
25. Realize a positive clipper with bias and observe the waveform on a CRO.
26. Realize a negative clipper without bias and observe the waveform on a CRO.
27. Realize a negative clipper with bias and observe the waveform on a CRO.
28. Realize a zener diode clipper and observe the wave form on a CRO.
29. Realize a Clamper circuit and observe the input and output waveforms on CRO.
30. Plot the resonance curve of a given series tuned circuit.
31. Plot the resonance curve of a given parallel tuned circuit.

Digital Electronics Lab Practice

Course Title :	**Digital electronics lab practice**	Course Code	**18EC-308P**
Semester	**III**	Course Group	**:Core**
Teaching Scheme in Periods(L:T:P)	**1:0:2**	Credits	**: 1.5**
Methodology	**Lecture + Practical**	Total Contact /Periods :	**:45**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

This course requires the basic skills of Handling bread boards and PCB.

Course outcomes:

On successful completion of the course, the students will be able to attain below Course Outcome

Course Outcome		**CL**	**Linked PO**	**Teaching Hours**
CO1	Identify Basic Gates and Logic Families	R/U/A	1,2,3,4,5,6,7,8	**9**
CO2	Realization of Boolean Functions using Gates	R/U/A	1,2,3,4	**15**
CO3	Verification of truth tables of Multiplexers and DeMultiplexers/encoder, BCD decoder.	R/U/A	1,2,3	**9**
CO4	Flip Flops & Timing Circuits Counters & Shift Registers	A	1,2,3,10	**12**
				45

Course Contents:

I. Basic Gates and Logic Families

1. Identify Digital ICs and noting down pin details from data sheets

a. Identify the given digital ICs and draw the pin diagrams. (Use TTL and CMOS ICs of AND, OR,NOT, NAND, NOR and XOR gates with two and three inputs).

b. Realize basic gate functions using toggle switches and a bulb.

2. Verify the truth tables of basic gates using universal gates.

a. Verify the truth table of 7403 IC (open collector quad 2input NAND gate).

b. Verify the Truth table of 4073 IC.

3. a) Implement OR gate using NAND gates only and verify the Truth Table

b) Implement NOT gate using using NOR gates only and verify the Truth Table

4. a) Verify the truth table of AND gate using NOR gates only.

b) From the data sheets find out CMOS equivalent of above ICs.

II. Realizing Boolean Functions.

5. a). Verify the truth table of XOR using TTL NAND gates only.

b) Verify the truth table of XOR using CMOS NOR gates only.

c) From the data sheets find out CMOS Equivalent of XOR ICs.

6. a) Implement a given Boolean function using basic gates and verify the truth table.

b) Implement a given Boolean function using NAND gates only and verify the truth table.

7. a) Verify the truth table of half adder using basic gates only.

b) Verify the truth table of half adder using NAND gates only.

8. a) Verify the truth table of full adder using 2 half adders.

b) Implement a full adder using NOR gates only.

III. Realization of Boolean Functions using Multiplexers and Demultiplexers

9. a) Verify the truth table of IC 74153MUX.

b)Verify the truth table of IC 74154 DE-MUX.

10. a) Verify the function of 74148 Encoder and write the truth table

b)Verify the function of 74138 Decoder and write the truth table

11. a) Verify the to decimal decoder and write function of BCD its truth table.

b) Verify the function of decimal BCD to encoder and write its truth table.

IV. Flip Flops &Sequential Circuits

12. a) Construct clocked RS FF using NAND gates and Verify its truth table.
b) Verify the truth table of CD 4013 Dual D flip Flop

13. a) Verify the functionality and truth table of 74L71 RS flip flop with Preset and Clear

b)Verify the Truth table of JK FF using 7476 IC.

14. a) Construct and verify the function of decade counter using 7490 ICs.

    b) Verify the function of up/down counter using 74190, 74193

15. a) Verify the function of CD 4029 up/down counter.

    b) Verify the function of shift register (ICs like 7495or 74194 etc.)

    c) Verify the function of Johnson counter using CD 4017 IC

CIRCUIT DESIGN AND SIMULATION LAB PRACTICE

Course Title :	**Circuit Design and Simulation Lab Practice**	Course Code	**18EC-309P**
Semester	**III**	Course Group	**Core**
Teaching Scheme in Periods(L:T:P)	**1:0:2**	Credits	**1.5**
Methodology	**Lecture + Practicals**	Total Contact Period :	**45 Pds**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites :

This course requires the knowledge of basic understanding of Electronic Devices and Circuits, Digital Electronics and Analog Communications

Course outcomes

Course Outcome		Linked PO	Teaching Hours
CO1	Practice with Simulation software like ORCAD/MULTISIM/PSPICE Environment	1,2,3,4,5,6,7	15
CO2	Design and verify the results of various electronic circuits using Simulation software and verify the result	1,2,3,4,10	15
CO3	Demonstrate Skills using ORCAD / MULTISIM/PSpice to simulate Network Theorems	1,2,3,4,10	10
CO4	Demonstrate Skills using ORCAD / MULTISIM/PSpice to simulate Modulation Techniques	1,2,3,4,8,9,10	5

Course Contents:

Unit-1: Practice with Simulation software like ORCAD/MULTISIM/PSpice Environment

1. Familiarize ORCAD suite/MULTISIM/PSpice/ environment
2. Use various tool bars such as standard toolbar, main toolbar, simulation toolbar, view tool bar components toolbar, virtual toolbar, graphical annotation toolbar and instruments toolbar
3. Familiarize its features
4. Select and Place various Electronic Components and wire them
5. Draw the circuit and simulate and Debug the errors
6. Capture and simulate a potential divider circuit

Unit-2: Design and verify the results of various electronic circuits using Simulation software

7. Verify Ohm's law and simulate it using ORCAD suite/MULTISIM/PSpice/similar software

8. Design and implement a) Low pass filter with a cut off frequency of 10 kHz and b) High pass filter with a cut off frequency of 10 kHz and evaluate the performance

9. Simulate Full wave Rectifier with filter

10. Simulate Clipper and Clamper circuits

11. Design and simulate BCD to excess-3 code and vice versa using logic gates

12. Design and simulate Binary to gray and vice-versa vice versa using logic gates

13. Design and simulate 4 bit odd/even parity generator

14. Design and simulate 4 bit ripple counter with Mod-10 and Mod- 12

Unit-3: Demonstrate Skills using ORCAD / MULTISIM/PSpice to simulate Network Theorems and Modulation Techniques

15. Simulate the given AM modulation circuit

Reference Book:

1. ORCAD software User manual.
2. MULTISIM user manual
3. Electric circuits by Schaum's series
4. PSpice user manual

E Learning Resources

2. www.electronics-tutorials.ws
3. www.nptel.ac.in
3. http://www.electronics-lab.com/downloads/circutedesignsimulation
4. https://www.orcad.com

Communication Skills and Life Skills

Course Title	**Communication Skills and Life Skills**	Course Code	**18 Common 310 P**
Semester	**III**	Course Group	**Foundation**
Teaching Scheme in Periods- L: T:P	**1:0:2**	Credits	**1.5**
Methodology	**Lecture + Practical**	Total Contact Periods	**45**
CIE	**60 Marks**	SEE	**40 Marks**

Rationale:

This course is designed to impart communication skills and life skills to the students of diploma which will help them a great deal in personal and professional fronts.

Prerequisites:

This course requires the basic knowledge of vocabulary, grammar, and four language learning skills, viz. Listening, Speaking, Reading and Writing.

Course Outcomes:

	At the end of the course the students will have the ability to:
Listening Skills	Identify the main or the central idea. Listen for specific details. Learn the pronunciation.
Communication Skills – I	Learn relevant vocabulary to make introductions. Learn to introduce oneself in formal and informal situations. Learn vocabulary and expressions useful for describing objects Describe objects
Communication Skills – II	Learn vocabulary to talk about the past Describe the incidents that happened in the past Learn the techniques of organising the matter / content for one-minute speech. Speak fluently and accurately using appropriate body language.

Life Skills – I	Think positively. Develop positive attitude. Overcome negative attitude. Know the importance of setting goals. Set goals using SMART features.
Life Skills – II	Know the reasons for a problem. Learn to overcome problems. Learn the various techniques to solve the problems. Learn to make proper decisions on time. Think 'out of the box'. Learn to be creative. Think innovatively. Think critically.
Life Skills – III	Know how to be a leader. Learn the qualities of a good leader. Learn the qualities of a good team. Learn the advantages and disadvantages of a team. Manage time effectively. Learn various time management techniques. Learn the importance of prioritisation.

CO-PO Matrix

	Course Outcome		**Linked PO**	**Teaching Periods**
CO 1	Listening for main idea and specific details	**R/U/A**	**1, 2, 3, 4, 5,7,8, 9,10**	**9**
CO 2	Introduce oneself and Describe Objects	**R/U/A**	**1,2,3,8,9,10**	**6**
CO 3	Talk about the past and speak fluently for one minute	**R/U/A**	**1,2,3,7,8.9,10**	**6**
CO 4	Develop positive attitude and set short term and long term goals	**R/U/A**	**1,2,3,7,8,9,10**	**6**
CO 5	Learn to solve a problem, make decisions and think innovatively	**R/U/A**	**1,2,3,7,8,9,10**	**9**
CO6	Learn to become a good team member and leader	**R/U/A**	**1,2,3,7,8,9,10**	**9**

Course Contents:

I. Listening Skills **Duration: 9**

1. Listening – I
    - Digital Camera
    - A Dialogue
    - Wild Animal / Human conflict
2. Listening – II
    - A Recipe
    - A Telephone conversation
    - An Interview

II. Communication Skills – I **Duration:6**

3. Introducing Oneself
4. Describing Objects

III. Communication Skills – II **Duration:6**

5. Talking About the Past
6. Just A Minute

IV. Life Skills – I **Duration:6**

7. Attitude
8. Goal Setting

V. Life Skills – II **Duration:9**

9. Problem Solving and Decision-Making Skills
10. Critical Thinking & Creativity

VI. Life Skills – III **Duration:9**

11. Leadership and Teamwork
12. Time Management

Suggested Student Activities:

- Listening Comprehension
- Seminars
- Paper Presentations
- Line ups for introducing oneself
- Describing persons / places / things
- Picture description
- Role Plays
- Dumb charades
- What is in the bag? (Identify the objects)
- Games using Online Dictionaries
- Sharing the information using emails, chats and groups
- Just A Minute
- Writing diary events
- Find a solution to the problem
- Making innovative things through recycling
- Creating advertisements
- Five-minute activities on Life Skills
- Watching videos on life skills and making presentations

Evaluation Pattern:

I. Continuous Internal Examination: 60 Marks

a. **Mid Sem- I** 20 marks
Syllabus:
i. Listening Skills
ii. Communication Skills - I

b. **Mid Sem – II** 20 Marks
Syllabus:
i. Communication Skills - II
ii. Life Skills - I

c. **Internal assessment**: 20 marks

i. Seminars: 10 marks
ii. Assignments: 5 marks
iii. Lab record submission: 5 marks

II. Semester End Examination : 40 Marks

a. Listening: 10 Marks
b. JAM or Role plays: 15 Marks
c. *Viva Voce* on any life skills topic : 15 Marks

References:

1. Flint, Chrisand Jamie Flockhart*Listening: A2 (Collins English for Life: Skills)*Collins. 2013
2. *Brown, Stephen E. English in Everyday Life. McGraw-Hill Education.2008*
3. Mohanraj, Jayashree. *Let Us Hear Them Speak: Developing Speaking-Listening Skills in English*.Sage. 2015
4. Susan Earle – Carlin. *Q Skills for Success: Listening and Speaking 5: Student Book with Online Practice*. Oxford University Press. 2013
5. Kumar, Sanjay and Pushpa Latha. *Communication Skills: A Work Book*.Oxford University Press. 2018
6. Carnegie, Dale.*The Leader in You*. Simon & Schuster: 1995
7. Carnegie, Dale.*The Art of Public Speaking*. Prabhat Prakashan. NewDelhi.2013
8. Kaye, Martin. Goal Setting (Workbook Included): Goals & Motivation: Introduction To A Complete & Proven Step-By-Step Blueprint For Reaching Your Goals (Goal Setting Master Plan 1). Kindle Edition. MK Coaching.2016.
9. West, Steven. Critical Thinking Skills: Practical Strategies for Better Decision making, Problem-Solving and Goal Setting. Kindle Edition.2018
10. Tracy, Brain. Goals. Berret-Koehler PublishersInc. San Francisco. 2017
11. Tracy, Brain. Master your Time Master your Life. Penguin Random House Inc. New York. 2017

Sean Covey . *The 7 Habits of Highly Effective Teens.* Simon and Schuster,2011

E-Learning Resources:

1. http://www.bbc.co.uk/worldservice/learningenglish/youmeus/learnit/learnitv39.shtml
2. https://www.examenglish.com/leveltest/listening_level_test.htm
3. https://www.oxfordonlineenglish.com/listening?utm_referrer=https%3A%2F%2Fwww.google.co.in%2F
4. https://takeielts.britishcouncil.org/prepare-test/free-ielts-practice-tests/listening-practice-test-1
5. https://learnenglish.britishcouncil.org/en/listening
6. https://www.cambridgeenglish.org/learning-english/activities-for-learners/?skill=listening
7. https://www.businessenglishsite.com/business-english-listening.html

BOARD DIPLOMA EXAMINATION (C-18)
THIRD SEMESTER 18 COMMON-310P
COMMUNICATION SKILLS AND LIFE SKILLS
MID SEM - I

Time : 1 Hour **Total Marks: 20 Marks**

Part – A **10 marks**

1. Listening Comprehension: 5 X 2 = 10

(Teacher should give the questions before reading the passage given below)

Florence Nightingale was an English social reformer and a statistician, and the founder of modern nursing. She was born in Florence, Italy, on May 12, 1820. Part of a wealthy family, Nightingale defied the expectations of the time and pursued what she saw as her God-given calling of nursing during the Crimean War. She and a team of nurses improved the unsanitary conditions at a British base hospital, greatly reducing the death count. Her writings sparked worldwide health care reform, and in 1860 she established St. Thomas' Hospital and the Nightingale Training School for Nurses. A revered hero of her time, she died on August 13, 1910, in London. Nightingale came to prominence while serving as a manager and trainer of nurses during the Crimean War, in which she organized care for wounded soldiers. She gave nursing a favorable reputation and became an icon of Victorian culture, especially in the persona of "The Lady with the Lamp" making rounds of wounded soldiers at night.

Questions:

1. Who was Florence Nightingale?
2. When and where was she born?
3. What does the passage convey?
4. When did she pass away?
5. Where did she establish nursing school?

PART- B **10 Marks**

Instruction: Answer any one of the questions in 150 words.

2. How do you introduce yourself formally in an interview?
3. Describe your polytechnic.

BOARD DIPLOMA EXAMINATION (C-18)
THIRD SEMESTER 18 COMMON-310P
COMMUNICATION SKILLS AND LIFE SKILLS
MID SEM - II

Time : 1 Hour **Total Marks: 20 Marks**

Part – A **10 marks**

Instruction: Answer any one of the following questions in 150 words.

1. Describe how you have spent your summer vacation.
2. What are the features of good JAM presentation? What precautions do you before speaking for one minute on the given topic?

Part – B **10 marks**

Instruction: Answer any one of the following questions in 150 words.

3. What is positive attitude? Give examples of positive attitude from your life.
4. Mention your long term goal with SMART features. How do you achieve it?

BOARD DIPLOMA EXAMINATION (C-18)
THIRD SEMESTER 18 COMMON-310P
COMMUNICATION SKILLS AND LIFE SKILLS
SEMESTER END EXAM

Time : 3 Hours **Total Marks: 40 Marks**

Part – A **10 marks**

1. Listen to the following passage and answer the questions give below it**. 5 X 2 = 10**

(Teacher should give the questions before reading the passage)

Answer the following questions after teacher reads the following paragraph.

Prof. Jayashankar was born to Mahalaxmi and Laxmi Kantha Rao on 6th August 1934 in Akkampet village, Warangal District. He was a Doctorate in Economics. He worked as a Vice-Chancellor of Kakatiya University. He worked in many capacities. He was popularly known as "Pedda Sir." He inspired many a people to fight for the cause of Telangana Statehood.

At the age of twelve, Jayashankar refused to sing songs in praise of the Nizam and insisted on singing Vande Mataram instead. As an intermediate student, in 1952, he protested against State Reorganization Committee plan to merge with the Andhra Rashtra. He took an active part in the agitations of "Non – Mulki go back" and " Idli Sambar go back." He took an active part in Telangana separate statehood agitation in 1969 too. In 1999, Prof. Jayashankar started the Telangana Development Forum in the USA which helped to propagate the injustice, discrimination and exploitation meted out to Telangana region and people in the aspects of employment, funds and water resources. He relentlessly put his efforts to end the struggle of Telangana people. He passed away on June 21, 2011. He was 76 years old at the time of his death.

Questions:

1. Where was Prof. Jayashankar born?
2. Why didn't he sing songs in praise of the Nizam?
3. Why did Jayashankar start the Telangana Development Forum in USA?
4. What are the two agitations in which he took an active part?
5. What is the meaning of 'relentlessly'?

Part – B **15 marks**

2. JAM / Role Plays

Part – C **15 marks**

3. Viva Voce on Life Skills topics

SKILL UPGRADATION-III

Course Title	**: Skill Upgradation -III**	Course Code	**:Common**
Semester	**: II**	Course	**: Core**
Teaching Scheme in periods (L :	**: 0:0:7**	Credits	**: 2.5**
Methodology	**: Activities**	Total Contact	**: 105**
CIE	**: Rubrics**	SEE	**: Nil**

Rationale: This course is introduced for all semesters with a purpose of providing outside classroom experiences that lead to overall development of the students. One whole day is allocated for activities.

Course Objective:

1. To create an awareness on Engineering Ethics and Human Values.
2. To instill Moral, Social Values and Loyalty.
3. Create awareness about social responsibilities of Engineers
4. To improve Communication and Participation skills

Course Content and Blue Print of Marks for SEE			
Activity No	Activity	Periods	Frequency
1	Haritha Haram(plantation &Maintenance)	9	3 times in a semester
2	Waste management	12	3 times in a semester
3	Swach Bharath	28	4 times in a semester
4	Mini projects	7	1 time in a semester
5	Video Clips	9	3 times in a semester
6	Seminar/Quiz/Presentation/Group discussion	18	6 times in a semester
7	Local Visits (also with in the campus)	6	2 times

8	Expert Lectures • Safety and Responsibilities of an Engineer • Occupational crime/Cyber crimes • Responsibility of engineers • Emerging technologies	16	4 Times
Total Periods		105	

Note: in case Expert faculties are not available English faculty may handle the expert lectures or Video clips on the suggested lectures may be played and the suggested activities are flexible.

Course Outcomes

CO	Outcome	CO/PO Mapping
CO1	Practice the moral values that ought to guide the Engineering profession.	1,2,5,6,7,8,9,10
CO2	Develop the set of justified moral principles of obligation, ideals that ought to be endorsed by the engineers and apply them in real life situations	8,10
CO3	Create awareness of saving environment through activities	3,4,5,8,9
CO4	Create awareness of Constitution of India	1,4,7,8,9,10

COURSE CONTENT:

SAFETY, RESPONSIBILITIES OF ENGINEERS

Safety and risk-definition- - assessment of safety and risk - risk benefit analysis and reducing risk-– Personal risk-Public risk-Reducing risk-Voluntary Risk-Collegiality and loyalty–Authority- Types-collective bargaining -occupational crime –Responsibility of engineers–Types-Social responsibility-Professional responsibility-confidentiality-conflicts of interest-liability

Evaluation:

The student must maintain a record of all activities conducted on ***skill upgradtion/ Activities*** day and prepare a soft copy of report and submit it to their mentor or upload to the institute website or mail.

The reports shall be evaluated by the mentors though rubrics and accordingly give the eligibility for 2.5 credits . The student must have participated in at least 75% of activities to get eligibility.

CO-PO Mapping Matrix											
	Basic knowledge	Discipline Knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & sustainability	Ethics	Individual and Team work	Communication	Lifelong learning	Mapped PO
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	
CO1	✓				✓					✓	5,10
CO2					✓					✓	5,10
CO3						✓	✓		✓	✓	6,7,9,10
CO4					✓		✓			✓	5,7,10