P.K.UNIVERSITY, SHIVPURI (MP)
(FACULTY OF ENGINEERING & TECHNOLOGY)

EVALUATION SCHEME & SYLLABUS

FOR

Diploma in Electronics & Instrumentation Engineering

(II Year- III Semester)

(ON)

CHOICE BASED CREDIT SYSTEM (CBCS)

[Effective from the Session: 2025-26]

Evaluation Scheme

Study And Evaluation Scheme For Diploma In Electronics &Instrumentation Engineering

SEMESTER -III

SUBJECT CODE	SUBJECTS NAME	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME						Total Marks
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT			
		L	T	P		Th	Pr	Tot	Th	Pr	Tot	
DFUNCEI301	Functional Communication	3	0	0	3	30		30	70	-	70	100
DAPPLEI302	Applied Mathematics -III	3	1	0	4	30	-	30	70	-	70	100
DELECEI303	Electrical Engineering-II	3	0	0	3	30	-	30	70	-	70	100
DELECEI304	Electronics Devices & Circuits	3	1	0	4	30	-	30	70	-	70	100
DINDUEI305	Industrial Electronics & Transducers	3	0	0	3	30	-	30	70	-	70	100
DELECEI303	Electrical Engineering-II	0	0	2	1	-	25	25	-	25	25	50
DFUNCEI301	Functional Communication	0	0	2	1	-	25	25	-	25	25	50
DELECEI304	Electronics Devices & Circuits	0	0	2	1	-	25	25	-	25	25	50
Total		15	2	6	20	150	75	225	350	75	425	650

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DFUNCEI301: FUNCTIONAL COMMUNICATION

DETAILED CONTENTS

L	T	P
3	0	0

Section "A" (English) Text Lessons

Unit I. On Communication **(25 Periods)**

Unit.II Exploring Space

Unit.III Sir C.V. Raman

Unit.IV Professional Development of Technicians

Unit.V Buying a Second Hand Bicycle

Unit.VI Leadership and Supervision

Unit.VII First Aid

Unit.VIII the Romanance of Reading

Unit.IX No Escape from Computers

Unit.X Bureau of Indian Standards

Section "B" Hindi **(35 Periods)**

1. स्वरोजगार
2. भारतीय वैज्ञाननक ों एवम तकनीनकय ों का भारत के नवकास में य गदान
3. ग्राम्य नवकास
4. पररवार ननय जन
5. सामानजक सोंस्थायें
6. ननय जन और जन कल्याण
7. भारत में प्रध नगकी के नवकास का
8. हररत क्ाोंनत
9. पयाावरण एवम मानव प्रदूषण
10. श्रनमक कल्याण
11. भारत में श्रनमक आन्द लन

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DAPPLEI302: APPLIED MATHEMATICS - III DETAILED CONTENTS

	L	T	P
1. Matrices (16 Periods)	**3**	**1**	**0**

1.1 Algebra of Matrices, Inverse

Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermition, Orthogonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix.

Definition and Computation of inverse of a matrix.

1.2 Elementary Row/Column Transformation

Meaning and use in computing inverse and rank of a matrix.

1.3 Linear Dependence, Rank of a Matrix

Linear dependence/independence of vectors, Definition and computation of rank of matrix. Computing rank through determinants, Elementary row transformation and through the concept of a set of independent vectors, Consistency of equations.

1.4 Eigen Pairs, Cayley-Hamilton Theorem

Definition and evaluation of eign values and eign vectors of a matrix of order two and three, Cayley-Hamilton theorem (without Proof)and its verification, Use in finding inverse and powers of a matrix.

2. Differential Calculus (15 Periods)

2.1 Function of two variables, identification of surfaces in space, coincides

2.2 Partial Differentiation

Directional derivative, Gradient, Use of gradient f, Partial derivatives, Chain rule, higher order derivatives, Euler's theorem for homogeneous functions, Jacobeans.

2.3 Vector Calculus

Vector function, Introduction to double and triple integral, differentiation and integration of vector functions, gradient, divergence and curl, differential derivatives.

3. Differential Equation (15 Periods)

3.1 Formation, Order, Degree, Types, Solution Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, nonlinear equation.

3.2 First Order Equations

Variable separable, equations reducible to separable forms, Homogeneous

equations, equations reducible to homogeneous forms, Linear and Bernoulli Form exact equation and their solutions.

3.3 Higher Order Linear Equation :

Property of solution, linear differential equation with constant coefficients (PI for $X=, e^{ax}$ Sinax, Cosax, X^n, $e^{ax}V$, XV

3.4 Simple Applications

LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

4. Integral Calculus-II (12 Periods)

4.1 Beta and Gamma Functions

Definition, Use, Relation between the two, their use in evaluating integrals.

4.2 Fourier Series

Fourier series of f(x),-n<x<n, Odd and even function, Half range series.

4.3 Laplace Transform

Definition, Basic theorem and properties, Unit step and Periodic functions, inverse Laplace transform, Solution of ordinary differentialequations

5. Probability and Statistics (12 Periods)

5.1 Probability

Introduction, Addition and Multiplication theorem and simple problem.

5.2 Distribution

Discrete and continuous distribution, Binomial Distribution, Poisson distribution, Normal Distribution.

RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
3 Applied Mathematics-III by Chauhan and Chauhan, Krishna Publications, Meerut**.**
4. Applied Mathematics-II by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut.
5. Ebooks/etools/relevant software to be used as recommended by AICTE/UBTE/NITTTR, Chandigarh.

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DELECEI303: ELECTRICAL ENGINEERING-II

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DETAILED CONTENTS

A.C. THEORY (10 Periods)

1.1 Representation of sinusoidal quantities by phasors.

1.2 Physical explanation of the phase relationship between voltage and current when Sinusoidal alternating voltage is applied across:-Pure resistance,

(a) Pure inductance and

(b) Pure capacitance.

1.3 Explanation of inductive reactance, capacitive reactance and their significance.

1.4 Relationship between voltage and current when alternating voltage is applied to

(a) Resistance and inductance in series,

(b) Resistance and capacitance in series.

1.5 Power in pure resistance, inductance and capacitance; power in combination of R-L-C circuits; power factor.

1.6 Active and reactive currents and their significance; practical importance of power factor.

1.7 Series and parallel resonance in R-L-C circuits, Q-factor of coils and capacitance.

1. Three Phase Supply (10 Periods)

1.1 Elementary idea about 3-phase supply.

1.2 Star and delta connection. Relationship between phase and line voltage and currents.

1.3 Power and power factor in three phase system and their measurement.

1.4 Comparison between three phase and single phase supply.

2. Transformers (10 Periods)

2.1 Principle of operation.

2.2 E.M.F equation, Voltage & Current relations.

2.3 Construction and applications of small transformers used in electronics and communication engg. construction of auto transformers, constant voltage transformer.

2.4 Phasor diagram of a transformer on load; Definition of regulation and efficiency; Elementary idea of losses in transformer, open circuit and short circuit test.

3. **D.C. Machines** (10 Periods)

3.1 D. C. Generator:

Working principle, constructional details, e.m.f equation, types of generators and their applications.

3.2 D. C. Motor:

Working principle, back e.m.f., types of D. C. motor and elementary idea of their characteristics, torque equation, methods of speed control (Description only).

3.3 Starters for D.C. Machines

4. **Induction Motors** (06 Periods)

4.1 Single Phase Induction Motor Principle of operation and constructional details of single phase FHP Induction motors (Split phase, capacitor start capacitor run, shaded pole, reluctance start, A.C. series, Universal, hysteresis, servo and stepper motors their applications).

4.2 Starter Motor

5. **Synchronous Machines** (10 Periods)

5.1 Alternators working principle, types of alternators, (brief description)

5.2 Synchronous Motors: Working principle, construction details, vector diagram, effect of excitation on Armature current and power factor, synchronous condenser. Application of synchronous machines.

RECOMMENDED BOOKS

1. A Text book of Electrical Technology by B.L. Thereja, A.K Theraja by S. Chand Publication.
2. Basic Electrical Engineering by V.K Mehta, Rohit Mehta, S. Chand Publication.
3. Electrical Engineering by J. B. Gupta; S.K Kataria& Sons Publication.
4. E-books/e-tools to be used as recommended by AICTE/NITTTR, Chandigarh.

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DELECEI304: ELECTRONIC DEVICES AND CIRCUITS

1. SINGLE STAGE AMPLIFIERS:

1.1 Transistor hybrid low frequency model in CE configuration, 'h' parameter and their physical significance, typical values of 'h' parameters and their determination by transistor characteristics.
1.2 Expressions for voltage gain, current gain, input and output impedance for a single stage CE amplifier circuit in ' h' parameters, appropriate approximations.

2. MULTISTAGE TRANSISTOR AMPLIFIERS:

2.1 Need of multistage amplifier, different coupling schemes and their working, brief mention of application of each of the type of coupling.
2.2 Working of R.C. coupled and transformer coupled multistage amplifier, approximate calculation of voltage gain for a two stage R-C coupled amplifier.
2.3 Frequency response of R-C coupled and transformer coupled amplifiers and its physical explanation, definition and physical significance of the term as bandwidth, upper and lower cross over frequencies etc.
2.4 Direct coupled amplifier and its limitations differential amplifier typical circuits diagram and its working.

3. TRANSISTOR AUDIO POWER AMPLIFIERS:

3.1 Difference between voltage and power amplifier, importance of impedance matching in power amplifier, collector efficiency of power amplifier.
3.2 Typical single ended power amplifier and its working, graphical method for calculation of output power, heat dissipation curve and importance of heat-sinks, class A, class B, class C amplifier (without derivation).
3.3 Working principle of push pull amplifier and circuits, its advantages over single ended power amplifier, cross over distortion in class B operation & its reduction, different driver stages for push pull amplifier circuit.
3.4 Working principle of complementary symmetry push pull circuit and its advantages.
3.5 Boot strap technique in amplifiers.
3.6 Transformer less audio power amplifiers and their typical application.
3.7 Mention of at least one popular IC with its block diagram, Pin configuration and it working of each type of power amplifier.

4. FEED BACK AMPLIFIERS:

4.1 Basic principle and types of feedback.
4.2 Derivation of expression for the gain of an amplifier employing feedback.
4.3 Effect of negative feedback on gain, stability, distortion and band width
(Only physical explanation)

4.4 Typical feedback circuits:
(a) A.C. coupled amplifiers with emitter by-pass, capacitor removed.
(b) Emitter follower and its application, simple mathematical analysis
for voltage gain and input impedance of above circuits.

5. TUNED VOLTAGE AMPLIFIERS:

5.1 Classification of amplifiers on the basis of frequency.
5.2 Review of basis characteristics of tunned circuits, (Series and Parallel)
5.3 Single and Double tuned amplifier, their working principles and frequency response (no mathematical derivation). Concepts of neutralization.
5.4 Staggered tuned amplifier and typical applications in brief.
5.5 Mention of at least one popular IC with its block diagram, Pin configuration and it working of each type of Tuned amplifier.

6. SINUSOIDAL OSCILLATORS:

6.1 Application of oscillators.
6.2 Use of positive feedback/negative resistance for generation of oscillation, barkhawn's criterion for oscillations.
6.3 Different oscillators circuits, tuned collector, Hartley, colpitts, phase shift, Wien's bridge and crystal oscillator and their working principles (no mathematical derivation).
6.4 Mention of at least one popular IC with its block diagram, Pin configuration and it working of each type of oscillators.

7. WAVESHAPING CIRCUITS:

7.1 General idea about different wave shapes.
7.2 Review of transient phenomena in R-C and R-L circuits.
7.3 R-C and R-L differentiating circuits and integrating circuits. Their applications
(Physical explanation for square/rectangular input wave shapes only).
7.4 Diode clippers series and shunt biased type double clipper circuits.
7.5 Zener diode clipper circuits.
7.6 Use of trnsistor for clipping.
Diode clamping circuit for clamping to negative peak, positive peak or any other levels for different input waveforms (e.g sine, square, triangular).

8. MULTIVIBRATOR CIRCUITS:

8.1 Ideal transistor switch; explanation using C.E. output characteristics, calculation of component values (collector and base resistors) for a practical transistor switch.
8.2 Transistor switching time. Use of speed up capacitor (Physical explanation).
8.3 Basic concept of working of collector coupled bistable, monostable and stable multivibrator circuits including principle of triggering.
8.4 Operation of Schmitt trigger, calculation of upper trigger potential (UTP) and lower trigger potential
8.5 Mention of applications of multivibrators and Schmit trigger. Its use as waveform generator.
8.6 Transistorized voltage controlled oscillator (basic) principle only.

8.7 Mention of at least one popular IC with its block diagram, Pin configuration
And it working of each type of Multivibrator circuits.

9. OPERATIONAL AMPLIFIERS:

9.1 Specifications of ideal operational amplifier and its block diagram.

9.2 Definition of inverting and non inverting inputs, differential voltage gain and input and output off set, voltage input offset current, input bias current, common mode rejection ratio (CMMR), power supply rejection ratio (PSRR) and slew rate.

9.3 Method of offset null adjustments, use of op.amp. as an inverter scale changer, adder, subtractor, differential amplifier, buffer amplifier, differentiator, integrator, comparator, Schmitt Trigger, Generation of Square and Triangular Waveform, log and anti-log amplifiers, PLL and
its application and IC power amplifier.

9.4 IC OP-AMP Application :

Inverting/Non inverting VCVS integrators, Differentiators CCVS and VCCS instrumentation amplifiers, Active filter (LP, HP and Notch), Oscillators. Log/Antilog modules, Precision rectifier, Peak detector, Sample &Hold Circuit, IC analog multiplier application, Analog multiplexer & Demultiplexer.

10. Timer Ic.:

Block diagram of Ic timer (such as NE 555) and its working, use of 555 timer
as monostable and astable multivibrator, and waveform generator.

11. Regulated Power Supply

11.1 Concept of regulation.

11.2 Basic regulator circuits (using zener diode).

11.3 Concept of series and shunt regulator circuits.

11.4 Three terminal voltage regulator Ics (positive negative and variable)
application. Block diagram, Pin configuration and working of popular regulator IC.

11.5 OP-AMP regulators, IC regulators, Fixed Voltage regulators, (78/79, XX)
723 IC regulators (Current Limiting, Current Fold Back), SMPS.

12. Introduction to Microelectronics-

- Advantages of integration, Types of integrated circuits, Monolithic and Hybrid circuits.
- Different stages of fabrication of ICs- Epitaxial
Growth, Oxidation and film deposition, Diffusion and Ion Implantation, Lithography & Etching. (Only brief idea of all)
- Masking, Selective doping, Fine-line lithography and isolation for Monolithic circuits.
- Introduction to monolithic device elements such as BJT, MOS, transistor and integration of other circuit elements.
- Very large scale in generation (V.L.S.I.). (Only brief idea)

RECOMMENDED BOOKS Basic Electronics and Linear Circuits by NN Bhargava; Tata McGraw Hill, New Delhi
Operational Amplifiers and Linear Integrated Circuits by Ramakant A. Gaykwad Malvino A. P-
Electronics principles "Tata McGraw- Hill"
Electronics Devices and Circuits by Robert L.
Boylestad and L:ovisNasherslay- Pearson Publication E-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Websites for Reference: http://swayam.gov.in

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DINDUEI305: INDUSTRIAL ELECTRONICS AND TRANSDUCERS

THYRISTORS AND THEIR APPLICATIONS

1.1 Name, symbol and typical applications of members of thyristor family.

1.2 SCR, Triac and Diac-Basic structure, operation, V-I characteristics and ratings, gate circuits, ratings, triggering process and triggering circuits, turn off methods and circuits, selections of heat sinks, mounting of thyristor on heat sinks, basic idea of protection of thyristor circuits.

1.3 Operation, V-I characteristics, equivalemt circuit and parameters of an UJT: Description of UJT relaxation oscillator, use of UJT relaxation oscillator for triggering thyristors.

1.4 Diac SCR and Triac switching circuits like automatic battery charger, voltage regulator, emergency light, alarm circuits, time delay relay circuits and circuits for over current and over voltage protection.

1.5 Single phase, various types of phase controlled rectifiers using SCR for resistive and inductive load explanation using wave shapes and appropriate mathematical equation (No derivation).

A.C. phase control using SCRs and triacs, Application of phase controlled rectifiers and A.C. phase control circuits in illumination control, temperature control, variable speed drives using d.c. moters and small a.c. machines.

1.6 Half wave, full wave (including bridge) poly phase rectifiers using SCRs; explanation using wave shapes and formula (no derivation). Operation of three phase bridge controlled rectifier and its applications.

1.7 Principle of operation of basic inverter circuits, basic series and parallel commutated inverters, principle of operation of cycloconverter, choppers and dual converter, mention of applications.

2. PRINCIPLES AND APPLICATIONS OF INDUCTION AND DIELECTRIC HEATING (No Mathematical Treatment)

Introduction, importance of heating in industry, Principle of induction heating, Industrial applications of induction heating, Principle of dielectric heating, Industrial applications of dielectric heating.

3. TRANSDUCERS:

Basic idea and principle of operation and their use in measuring physical parameters of the following types of transducers.

Transducer	Typical Applications
3.1 Variable Resistance Type	
Potentiometric Resistance strain gauge.	Displacement and force Torque and Displacement.
Resistance Thermometer.	Temperature.
Thermister.	Temperature.
3.2 Variable Capacitance Type	
Variable capacitance pressure gauge.	Displacement and pressure.
Capacitor microphone.	Speed, noise
Dielectirc gauge.	Liquid level & Thickness.
3.3 Variable Inductance Type	
Differential Transformer.	Pressure, force, displacement and position.
Magnetostrication gauge.	Force, pressure, sound.
3.4 Piezoelectric Type	
Crystal Microphone,	Crystal Oscillator

4. PROCESSING OF TRANSDUCER SIGNALS:

4.1 Characteristics of instrumentation amplifiers in respect of input impedance, output impedance, drift, dc offset, noise, gain common mode rejection, frequency response etc. Relating the suitability of these characteristics for amplifying signals from various transducers.

4.2 Block diagram and basic concept of open loop and closed loop systems.

5. OPTOELECTRONIC DEVICES:

5.1 Basic principle and characteristics of photo sources and photo detector, Photo resisters, photo Diodes, photo transistors, photo electric cells, LCDs, LEDs & photocuoplers.

5.2 LED- Material, Construction, Working, Power & Efficiency, Charactistics and modulation BW. Laser, Semiconductor Laser

5.3 Photo Detectors - Optical detection Principles, P-N photodiode, Avalanche Photodiode.

5.4 Electro-Optic Effect- Integrated optical Devices, Magneto- Optic Effect, Acousto-Optic Effect.

5.5 Sensors & Display Devices - Optical Fiber Sensors, Display Devices, LCD display, Numeric Display. (Only Brief description of above)

LIST OF BOOKS

1. M. H. Rashid-" Power Electronics Circuits, Devices & Application"- P.H.I
2. J. Michael Jacob - " Power Electronics : Principle and Application" - Viks Publishing House Pvt. Ltd.
3. Singh Jasprit - " Optoelectronics An Introduction to Materials and Devices" - McGraw-Hill
4. C. S. Ranjan- "Instrumentation Devices & Systems"- Tata McGraw Hill.

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DELECEI306: ELECTRICAL ENGINEERING-II LAB

1. To verify that in an A.C. circuit, the phasor sum (not the algebraic sum) of currents at any Junction is zero.
2. To find the voltage-current relationship in a R-L series circuit and to measure power and power Factor of the circuit.
3. To measure power and power factor in three phase system by two wattmeter method.
4. To determine the efficiency and regulation of a transformer by performing direct loading.
5. To measure the induced emf of separatly excited D.C. generator as a function of field current.
6. To measure the terminal voltage of a D.C. shunt generator as a function of load current.
7. To measure the speed of a separately excited D.C. motor as a function of load torque at rated Armature voltage.
8. To observe the difference in the starting current at switching on single phase capacitor start induction motor with :-
   (a) The capacitor disconnected and
   (b) The capacitor connected.
9. To determine V curves of a synchronous motor.

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DFUNCEI307: Functional Communication Lab

1. **Listening •** The student should be able to listen to a text read aloud in normal speed with
    i. focus on intonation.
    - After listening the student can fill-in-blanks, choose a suitable title, make a
        i. summary, supply required information and be able to answer comprehension
        ii. questions from the passage read aloud.
2. **IMPORTANCE OF LISTENING**, Characteristics of Good and Effective Listener(Is Attentive, Do Not Assume, Listen for Feelings and Facts, Concentrate on the Other Speakers Kindly and Generously, Opportunities)
3. **Speaking •** Reading aloud of dialogues, texts, poems, speeches focusing on intonation.
    - Self-introduction • Role plays on any two-situations. • Telephonic Conversations.
4. **NON-VERBAL COMMUNICATION-** Communication Skills

Non-Verbal Communication, We Communicate with Our Eyes, Communication with Facial Expression, A Good Gesture, Appearance, Posture and Gait, Proximity and Touch),

5. **Communication Skills ACTIVITIES –**Activities in Making Collages, Making Advertisements, PPT Preparation & Presentation, Speaking -Seminars, Group Discussions, Debates, Extempore Speeches, Listening to an audio clip and telling its Agist, Answering a telephone call, Making enquiries, General tips-Pronunciation, Tone, Pitch, Pace, Volume, relevance, brief, simple Reading Newspaper, Magazines (Current Affairs, Economic magazines, Technical magazines), How to read a report, article, Writing- Resume Writing, Writing joining report, Notice writing, Report making, Proposal writing, Advertisement, Notice for tender, Minutes writing, E-Mail writing, Listening News, Listening to audio clips.(Lecture, poetry, speech, songs),
6. **Body Language skills-**Introduction, What is Body Language , Body Language Parts, Personal Space Distances (Intimate Distance, Personal Distance, Social Distance, Public Distance),
7. **IMPORTANT BODY LANGUAGE SIGNS AND THEIR MEANING**

PERSONALITY DEVELOPMENT

1 Introduction to Personality Development

AIM, Skills, Types of Skills, LIFE SKILLS VS OTHER SKILLS,

Concept of Life Skills. Ten core Life Skills identified by WHO

2. Factors Influencing / Shaping Personality :

Introduction, Physical and Social Factors Influencing / Shaping Personality (Hereditary, Self-Development, Environment, Education, Life-situations) Psychological AND Philosophical Factors Influencing / Shaping Personality (Past Experiences, Dreams and Ambitions, Self-Image, Values)

3. Self Awareness – 1

DIMENSIONS OF SELF AWARENESS (Self Realization, Self Knowledge or Self Exploration, Self Confidence, Self Talk, Self Motivation, Self Esteem, Self Image, Self Control, Self Purpose, Individuality and Uniqueness, Personality, Values, Attitude, Character),

SELF REALIZATION AND SELF EXPLORATION THROUGH SWOT ANALYSIS AND JOHARI WINDOW,

4. Self Awareness – 2

SYMPATHY VS EMPATHY AND ALTRUISM,

Importance of Empathizing with Others,

5. Self Awareness – 3

Self-Awareness through Activity, Body Image (What is Body Image, What Decides our Body Image, What is Poor Body Image, What are the Harmful Effects of Poor Body Image), Tackling Poor Body Image(Enhance Self-Esteem, Build Up Critical Thinking, Build up Positive Qualities, Understand Cultural Variation, Dispel Myths, Utilize Life Skills)

6. Change Your Mind Set

What is Mindset, HOW TO CHANGE YOUR MINDSET (Get the Best Information Only, Make the best people your Role Model, Examine Your Current Beliefs, Shape Your Mindset with Vision and Goals, Find Your Voice, Protect Your Mindset, Let Go of Comparisons, Put An End To Perfectionism, Look At The Evidence, Redefine What Failure Means, Stop Worrying About What “People” Think)

7 • Achieving the target

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DELECEI308 : ELECTRONIC DEVICES AND CIRCUITS LAB

List of Experiment- (ANY TEN EXPERIMENTS)

1. To measure the overall gain of two stages R.C. coupled amplifier at 1 Khz and note the effect of loading of second stage on the first stage.
2. To plot the frequency response of R-C soupled amplifier.
3. (a) To plot the load Vs output power characteristics to determine the maximum signal input for undistorted signal output.

(b) The above experiment is to be performed with single ended power amplifier; Transistorized push; pull amplifier; Compl-ementary Symmetry power Amplifier.

4. To observe the effect of a by-pass capacitor by measuring voltage gain and plotting of frequency response for a single stage amplifier.
5. To measure input and output impedance of a feedback amplifier with and without by-pass capacitor.
6. Measurement of voltage gain input and output impedance and plotting of frequency response of an emitter follower circuit.
7. Measurement of resonant frequency, plotting of the response curve (i.e. graph between input frequency and impedance) and calculation of Q with the help of this curve for series and parallel resonant circuit.
8. To measure the frequency response of a single stage tuned voltage amplifier and calculation of the Q of the tuned circuit load.
9. Observe and plot the output wave shapes of ;

(a) R-C differentiating circuits.

(b) R-C integrating circuits for square wave input (Observe the effect of R-C time constant of the circuits on the output wave shape for both the circuits).

10. (a) Observe the output waveforms of given biased and unbiased series and shunt clipping circuits, for positive and negative peak clipping circuits, for positive & negative peak clipping of a sine wave using switching diodes & D-C sources and compare it with input wave.

(b) Observe the output wave shape of given double clipper circuit using diodes and D-C sources.

(c) Observe the output wave shape of given zener diode and transistor clipper circuits for positive peak, negative peak and double clipping sine (or other) wave shapes.

11. To clamp square wave to their positive and negative peaks and to a specified level.

12. To measure Ic and Vce for transistor when Ib is varied from zero to maximum value and measure the value of Vce and Ic for saturation at a given supply, voltage and load.

13. To test a transistor schmitt trigger circuit, observe and plot the wave shapes at various points.

14. Use of Op-Amp. (for IC-741) as Inverting and non-inverting amplifier, adder, comparator, buffer, scale changer.

15. Simple working circuits using NE555.

16. To determine the range of frequency variation of a RC phase shift oscillator.

17. To test adjustable IC regulator and current regulator.

18. Identification, Pin configuration and basic working of different popular IC's - Exm.- Power amplifier, Oscillator, Tuned amplifier, Multivibrator, Timer