Faculty of Engineering & Technology

P.K.University

Shivpuri (MP)

Evaluation Scheme & Syllabus for

Department of

Electronics & Communication Engg.

(III Semester)

(Effective from session 2025-26)

EVALUATION SCHEME
DIPLOMA ELECTRONICS & COMMUNICATION ENGINEERING

Study And Evaluation Scheme For Diploma Electronics& Communication Engineering												
SEMESTER -III												
SUBJECT CODE	**SUBJECTS NAME**	**STUDY SCHEME Periods/ Week**			**Credits**	**MARKSINEVALUATIONSCHEME**						**Total Marks of Internal & External**
						INTERNAL ASSESSMENT			**EXTERNAL ASSESSMENT**			
		L	**T**	**P**		**Th**	**Pr**	**Tot**	**Th**	**Pr**	**Tot**	
DFUNCEC301	**Functional Communication**	**3**	**0**	**0**	**3**	**30**	**-**	**30**	**70**	**-**	**70**	**100**
DAPPLEC302	**Applied Mathematics-III**	**3**	**1**	**0**	**4**	**30**	**-**	**30**	**70**	**-**	**70**	**100**
DELECEC303	**Electrical Engineering-II**	**2**	**1**	**0**	**3**	**30**	**-**	**30**	**70**	**-**	**70**	**100**
DELECEC303	**Electronic Devices & Circuits**	**3**	**1**	**0**	**4**	**30**	**-**	**30**	**70**	**-**	**70**	**100**
DINDUEC305	**Industrial Electronics & Transducers**	**3**	**0**	**0**	**3**	**30**	**-**	**30**	**70**	**-**	**70**	**100**
DELECEC306	**Electrical Engineering-II Lab**	**0**	**0**	**2**	**1**	**-**	**25**	**25**	**-**	**25**	**25**	**50**
DFUNCEC307	**Functional Communication Lab**	**0**	**0**	**2**	**1**	**-**	**25**	**25**	**-**	**25**	**25**	**50**
DELECEC308	**Electronic Devices & Circuits Lab**	**0**	**0**	**2**	**1**	**-**	**25**	**25**	**-**	**25**	**25**	**50**
DINDUEC309	**Industrial Electronics & Transducers Lab**	**0**	**0**	**2**	**1**	**-**	**25**	**25**	**-**	**25**	**25**	**50**
DCOMPEC310	**Computer Application Lab**	**0**	**0**	**4**	**2**	**-**	**25**	**25**	**-**	**25**	**25**	**50**
Total		**14**	**3**	**12**	**23**	**150**	**125**	**275**	**350**	**125**	**475**	**750**

Department of Electronics & Communication Engineering

(Faculty of Engineering & Technology)

P.K. University, Shivpuri (MP)

II Year III Semester

DFUNCEC301

FUNCTIONAL COMMUNICATION

(L-T-P-3-0-0)

[Common to All Diploma Engineering Courses]

Section "A" (English)

Text Lessons

Unit I.	On Communication
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

1.स्वरोजगार

2.भारतीय वैज्ञानिकों एवं तकनीकियों का भारत के विकास में योगदान

3.ग्राम्य विकास

4.परिवार नियोजन

5.सामाजिक संस्थायें

6.नियोजन और जन कल्याण

7.भारत में प्रौद्यागिकी के विकास का इतिहास

8.हरित कांन्ति

9.पर्यावरण एवं मानव प्रदू ण

10. श्रमिक कल्याण

11. भारत में श्रमिक आन्दोलन

Department of Electronics & Communication Engineering

(Faculty of Engineering & Technology)

P.K. University, Shivpuri (MP)

II Year III Semester

DAPPLEC302

APPLIED MATHEMATICS II

(L-T-P-3-0-0)

[Common to All Engineering Courses]

DETAILED CONTENTS

1. **MATRICES :**

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 a 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 :

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

2.2 Partial Differentiation : Directional derivative, Gradient, Use of gradient f, Partial derivatives, Chain rule, Higher order derivatives, Eulens theorem for homogeneous functions, Jacobians.

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:

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 seperable, equations reducible to separable forms, Homogeneous equtions, eqtions 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=eax, Sin ax, Cos ax, Xn, eaxV, 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:

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 differential equations.

5. PROBABILITY AND STATISTICS :

5.1 Probability: Introduction, Addition and Multiplication theorem and simple problem.

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

Department of Electronics & Communication Engineering

(Faculty of Engineering & Technology)

P.K. University, Shivpuri (MP)

II Year III Semester

DELECEC303

ELECTRICAL ENGINEERING-II

(L-T-P-2-1-0)

(Common with Instrumentation & Control Engineering)

DETAILED CONTENTS

1.0 A.C.THEORY

1.1 Representation of sinusoidal quantities by Phasor

1.2 Physical explanation of the phase relationship between voltage and current when sinusoidal alternating voltage is applied across:-

(a) Pure resistance,

(b) Pure inductance and

(c) 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 Solution and phasor diagrams for simple R-L-C circuits (Series and parallel); Impedance, Impedance triangle, phase angle.

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

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

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

1. THREE PHASE SUPPLY:

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:

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:

(a) D. C. Generator:

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

(b) **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).

(c) Starters for D.C. Machines

4. SYNCHRONOUS MACHINES:

(a) Alternators:

Working principle, types of alternators, constructional details. e.m.f. equation, condition for parallel operation.

(b) Synchonous Motors:

Working principle, construction details, vector diagram, effect of excitation on armature current and power factor, synchronous condenser.

(c) Application of synchonous machines.

5. INDUCTION MOTORS:

(a) Three Phase Induction Motor:

Working principle and constructional details, types of induction motor, slip ring and squirrel eage, slip in induction motors, speed torque characteristics, starting and speed control, application of induction motors in industry.

(b) 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, hysterisis, servo and stepper motors their applications).

(c) Starters for Induction motors.

Department of Electronics & Communication Engineering

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P.K. University, Shivpuri (MP)

II Year III Semester

DELECEC304
ELECTRONIC DEVICES AND CIRCUITS

(L-T-P-3-1-0)

(Common with Instrumentation & Control Engineering and Computer Engineering)

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.

1.2Expressions 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 inpedance 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 polular 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 feed back.

4.2 Derivation of expression for the gain of an amplifier employing feed back.

4.3Effect 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 leas one polular IC with its block diagram, Pin configuration and it working of each type of Tuned amplifier.

6. SINUSOIDAL OSCILLATORS:

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

7. WAVESHAPING CIRCUITS:

7.1 General idea about different waveshapes.
7.2 Reviewof transient phenomena in R-C and R-L circuits.
7.3 R-C and R-L differentiating circuits and integrating citcuits. Their applications (physical explanation for square/rectangular input waveshapes 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:

8.1Ideal 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.
8.4Operation of Schmitt trigger, calculation of upper trigger potential (UTP) and lower trigger potential (LTP).
8.5Mention of applications of multivibrators and Schmit trigger. Its use as waveform generator.
8.6 Transistorised voltage controlled oscillator (basic) principle only.
8.7 Mention of at least one polular 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 noninverting 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 appliation and IC power amplifier.
9.4 IC OP-AMP Application :
Inverting/Noninverting 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, Tyes of integrated circuits, Monolithic and Hybrid circuits.
- Different stages of fabrication of ICs- Epitaxial Growthh, Oxidation and film deposition, Diffusion and Ion Inplatation, 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 ingegration (V.L.S.I.). (Only brief idea)

Department of Electronics & Communication Engineering

(Faculty of Engineering & Technology)

P.K. University, Shivpuri (MP)

II Year III Semester

DINDUEC305
INDUSTRIAL ELECTRONICS & TRANSDUCERS

(L-T-P-3-0-0)

DETAILED CONTENTS

1. 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 waveshapes 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 cyclo converter, 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 Varible Resistance Type

Potentiometric Resistance Displacement and force strain gauge. Torque and Displacement.

Resistance Thermometer. Temperature. Thermister. Temperature.

3.2 Variable Capacitance Type

Variable capacitance Displacement and pressure. pressure gauge.
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 and 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.

Department of Electronics & Communication Engineering

(Faculty of Engineering & Technology)

P.K. University, Shivpuri (MP)

II Year III Semester

DELECEC306
ELECTRICAL ENGINEERING-II- LAB

(L-T-P-0-0-2)

(Common with Instrumentation & Control Engineering)

List Of Experiments

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 & power factor of the circuit.

3. To find for a filament lamp :-
   (a) Variation of resistance with temperature.
   (b) Variation of temperature with voltage.
   (c) Variation of resistance with voltage.
   (d) Variation of power with voltage.

4. To measure power and power factor in three phase system by two wattmeter method.

5. To determine the efficiency and regulation of a transformer by performing direct loading.

6. To measure the induced emf of separatly excited D.C. generator as a function of field current.

7. To measure the terminal voltage of a separatly excited D.C. generator as a function of load current.

8. To measure the terminal voltage of a D.C. shunt generator as a function of load current.

9. To measure the speed of a separately excited D.C. motor as a function of load torque at rated armature voltage.

10. To observe the difference in the starting current at Switching on single phase capacitor start induction motor with :- (a) The capacitor disconnected (b) The capacitor connected. Also to determine how to reverse the direction of rotation.

11. To start a Three Phase induction motor and to determine its slip at various loads.

12. To determine V curves of a synchronous motor.

Department of Electronics & Communication Engineering

(Faculty of Engineering & Technology)

P.K. University, Shivpuri (MP)

II Year III Semester

DELECEC308
ELECTRONIC DEVICES AND CIRCUITS LAB

(L-T-P-0-0-2)

(Common with Instrumentation & Control Engineering and Computer Engineering

List of Experiment

1. To measure the overall gain of two stage 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 waveshapes of ;

   (a) R-C differentiating circuits.

   (b) R-C integrating circuits for squarewave input (OBserve the effect of R-C time constant of the circuits on the output waveshape 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) waveshapes.

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 valur 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 waveshapes 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 polular IC's - Exm.- Power amplifier, Oscillator, Tuned amplifier, Multivibrator, Timer.

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II Year III Semester

DFUNCEC307

FUNCTIONAL COMMUNICATION – LAB

(L-T-P-0-0-2)

Department of Electronics & Communication Engineering

(Faculty of Engineering & Technology)

P.K. University, Shivpuri (MP)

II Year III Semester

DINDUEC309
INDUSTRIAL ELECTRONICS & TRANSDUCERS LAB

(L-T-P-0-0-2)

List Of Experiments

1. Identification of various types of packages and terminals of various low and high power thyristors (SCR and Triac).
2. To determine and plot firing charateristics of SCR :-
   (a) By varying the anode to chathode voltage.
   (b) By varying the gate current.
3. Observing voltage waveshapes at various points of UJT relaxation oscillator circuit.
4. Observation of waveshapes at relevant points of the circuit of a single phase controlled rectifier using SCR and UJT relaxation oscillator.
5. To determine the firing characteristics of Triac in different mode i.e. Mode-I (plus), Mode-I (minus), Mode-III (plus), Mode-III (minus).
6. Observe the waveshapes and measure a.c. and d.c voltage at various points of a three phase bridge rectifier circuit.
7. Observe the waveshapes and measure a.c. and d.c. voltage at various points of a three phase SCR controlled bridge rectifier circuit.
8. Test an a.c. phase control circuit using triac and observe waveshapes and voltages at relevant points in circuit (while using for lamp intensity control and/or a.c. fan speed control).
9. To study the working of a single phase SCR/ transistor inverter circuit by observing waveshapes at input and output.
10. To measure force and pressure by using strain gauge transducer.
11. To observe the working of crystal microphone.
12. To observe the working principle of following devices in practical circuit :-
    (a) Light Dependent Resistor (LDR).
    (b) Photo electric cell.
    (c) LED and LCDs.
    (d) Avalancha Photodiode
    (e) Optical fibre sensor
13. To measure voltages at differnt points of a circuit using a light sensitive device as ON-OFF control.

Department of Electronics & Communication Engineering

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II Year III Semester

DELECEC310

ELECTRONICS WORKSHOP (L-T-P-0-0-4)

PART-A ELECTRICAL WORKSHOP

LEARNING OUTCOMES:-

- After completing this course the learner will be able to:
- Plan and Wire a small domestic building for a given load requirement.
- Specify the wiring plans of semi-industrial installations with three phase supply and a maximum of 5 KVA load.

Exercises to be Performed

1. Identification and study of commonly used electrical materials such as wires, cables, switches, fuses, coiling, roses, battens, cleats and allied items.
2. Identification and study of various tools used in Electrical Workshop and safety measures.
3. Making connection of single lamp and three pin plug socket to supply using batten wiring.
4. Making Electrical connection for staircase wiring.
5. Making of extension board with proper supply.

PART-B ELECTRONICS WORKSHOP

LEARNING OUTCOMES:- After completion of instruction in this subject the student will:-

- Develop skill in selection and use of commonly used tools, equipment, components in a given situation.
- Develop skill in wiring, soldering and desoldering works.
- Develop skill in tracing circuits of simple (analog and digital) electronic assembly

Exercise to be Performed

1. Name and function of different tools and accessories including Tapes, Solders, Solders tips, Fluxes; De-soldering wick, Solder cleaning fluids, Sleeves, Tags.

2. Demonstrate the correct use of accessories mentioned in (1) above. 85 85

3. Given different type of power supply mention in (c), the student should be able to find out the operating range and regulate the power supplies Equipment Type.

4. Test waveform Generator :- Audio oscillator, Function, Generator, Signal Generator, Spectrum Analyzer.
5. Measurement Equipment ; Single beam CRO, Double beam/Dual trace CRO, electronic and Digital multimeters, Transistor tester/Curve tracer, IC tester etc.
6. Power Supply - UPS, Invertor, different types of DC/AC power supplies
7. Various types of Single/Multicored, Insulated screened, Power type/ Audio/ Video/ General purpose wires and cables
8. Exercises to be performed
9. Study and testing of different types of Resistor, Capacitor, Inductor, Diode, Transistor (BJT, FET, MOS, CMOS) and ICs (All Popular Families).
10. Study of different processes by performing in assembling- Soldering, Desoldering, Cutting, Stripping and connecting.
11. Making of different types of mini electronic projects

PART-C PREPARATION OF PRINTED CIRCUIT BOARDS

LEARNING OUTCOMES:- After completion of this Course, the learners will be able to prepare printed Circuit boards.

Exercise to be performed:- Study of different types of PCB circuit in order to:
1. Acquire skill in silk screen printing techniques for the purpose of making the printed circuits boards.
2. Exposure to Non dry-method of PCB making using photo processing techniques.
3. Prepare, check, drill and store PCBs.