

STATE BOARD OF TECHNICAL EDUCATION, BIHAR
Scheme of Teaching and Examinations for
III SEMESTER DIPLOMA IN ELECTRONICS & COMMUNICATION ENGINEERING
(Effective from Session 2016-17 Batch)

THEORY

| Sr. No. | SUBJECTS | SUBJECT CODE | TEACHING SCHEME | EXAMINATION – SCHEME | | | | | | | Credits |
|---------|----------------------------------|--------------|-------------------|----------------------|-------------------------------------|--------------------------|------------------------------------|---------------------|----------------|---------------------------|---------|
| | | | Periods per Week | Hours of Exam. | Teacher's Assessment (TA) Marks (A) | Class Test(CT) Marks (B) | End Semester Exam. (ESE) Marks (C) | Total Marks (A+B+C) | Pass Marks ESE | Pass Marks in the Subject | |
| 1. | Applied Mathematics-I | 1600301 | 04 | 03 | 10 | 20 | 70 | 100 | 28 | 40 | 03 |
| 2. | Computer Programming Through 'C' | 1600302 | 03 | 03 | 10 | 20 | 70 | 100 | 28 | 40 | 03 |
| 3. | Analog Electronics Circuit | 1638303 | 03 | 03 | 10 | 20 | 70 | 100 | 28 | 40 | 03 |
| 4. | Basic Electronic Engineering | 1638304 | 03 | 03 | 10 | 20 | 70 | 100 | 28 | 40 | 03 |
| 5. | Electronics Measurement-I | 1621305 | 03 | 03 | 10 | 20 | 70 | 100 | 28 | 40 | 03 |
| | | | Total:- 16 | | | | 350 | 500 | | | |

PRACTICAL

| Sr. No. | SUBJECTS | SUBJECT CODE | TEACHING SCHEME | EXAMINATION – SCHEME | | | | | Credits |
|------------|---|--------------|------------------|----------------------|-----------------|--------------|-------------------|---------------------------|---------|
| | | | Periods per Week | Hours of Exam. | Practical (ESE) | | Total Marks (A+B) | Pass Marks in the Subject | |
| | | | | | Internal (A) | External (B) | | | |
| 6. | Computer Programming Through 'C' Lab. | 1600306 | 06 | 03 | 15 | 35 | 50 | 20 | 03 |
| 7. | Analog Electronics Circuit Lab. | 1638307 | 04 | 03 | 15 | 35 | 50 | 20 | 02 |
| 8. | Electronic Measurement and Instrumentation Lab. | 1621308 | 04 | 03 | 15 | 35 | 50 | 20 | 02 |
| Total:- 14 | | | | | | | 150 | | |

TERM WORK

| Sr. No. | SUBJECTS | SUBJECT CODE | TEACHING SCHEME | EXAMINATION – SCHEME | | | | Credits |
|---------|-----------------------------------|--------------|---|--------------------------------|--------------------------------|--------------------------|---------------------------|-----------|
| | | | Periods per week | Marks of Internal Examiner (X) | Marks of External Examiner (Y) | Total Marks (X+Y) | Pass Marks in the Subject | |
| 9. | Basic Electronic Engineering (TW) | 1638309 | 03 | 30 | 70 | 100 | 40 | 02 |
| | | | Total:- 03 | | | 100 | | |
| | | | Total Periods per week Each of duration one Hours = 33 | | | Total Marks = 750 | | 24 |

APPLIED MATHEMATICS -I

(Elect./Chem./Textile/Agri./C.Sc.&E/Electro/Ceramic/Print/Ec.&Comm./Inst.& Cont.)

| Subject Code 1600301 | Theory | | | | | | Credits 03 |
|--------------------------------|-------------------------|---|-----|------------|---|-----|----------------------|
| | No. of Periods Per Week | | | Full Marks | : | 100 | |
| | L | T | P/S | ESE | : | 70 | |
| | 04 | — | — | TA | : | 10 | |
| | — | — | — | CT | : | 20 | |

| Contents :Theory | | Hrs/week | Marks |
|------------------|--|-----------|-----------|
| Unit -1 | Integration: 1.1 Definition of integration as anti-derivative. Integration of standard function. 1.2 Rules of integration (Integrals of sum, difference, scalar multiplication). 1.3 Methods of Integration. 1.3.1 Integration by substitution 1.3.2 Integration of rational functions. 1.3.3 Integration by partial fractions. 1.3.4 Integration by trigonometric transformation. 1.3.5 Integration by parts. 1.4 Definite Integration. 1.4.1 Definition of definite integral. 1.4.2 Properties of definite integral with simple problems. 1.5 Applications of definite integrals. 1.5.1 Area under the curve. 1.5.2 Area between two curves. 1.5.3 Mean and RMS values | 12 | 20 |
| Unit -2 | Differential Equation 2.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single constant. 2.2 Solution of differential equations of first order and first degree such as variable separable type, reducible to Variable separable, Homogeneous, Nonhomogeneous, Exact, Linear and Bernoulli equations. 2.3 Applications of Differential equations. 2.3.1 Laws of voltage and current related to LC, RC, and LRC Circuits. | 10 | 15 |
| Unit -3 | Laplace Transform 3.1 Definition of Laplace transform, Laplace transform of standard functions. 3.2 Properties of Laplace transform such as Linearity, first shifting, second shifting, multiplication by t^n , division by t . 3.3 Inverse Laplace transforms. Properties- linearly first shifting, second shifting. Method of partial fractions, 3.4 Convolution theorem. 3.5 Laplace transform of derivatives, 3.6 Solution of differential equation using Laplace transform (up to second order equation). | 08 | 14 |
| Unit -4 | Fourier Series 4.1 Definition of Fourier series (Euler's formula). 4.2 Series expansion of continuous functions in the intervals $(0, 2l)$, $(-l, l)$, $(0, 2\pi)$, $(-\pi, \pi)$ 4.3 Series expansions of even and odd functions. 4.4 Half range series. | 08 | 07 |

| | | | |
|-----------------|---|-----------|-----------|
| Unit - 5 | Numerical Methods | | |
| | 5.1 Solution of algebraic equations Bisection method. Regularfalsi method. Newton – Raphson method. | 05 | 07 |
| | 5.2 Solution of simultaneous equations containing 2 and 3 unknowns Gauss elimination method. Iterative methods- Gauss seidal and Jacobi’s methods. | 05 | 07 |
| | Total | 48 | 70 |

| Text /Reference Books: | | |
|---|---------------------------|--------------------------------------|
| Name of Authors | Titles of the Book | Name of the Publisher |
| Mathematics for polytechnic | S. P. Deshpande | Pune Vidyarthi Griha Prakashan, Pune |
| Calculus: single variable | Robert T. Smith | Tata McGraw Hill |
| Laplace Transform | Lipschutz | Schaum outline series. |
| Fourier series and boundary value problems | Brown | Tata McGraw Hill |
| Higher Engineering Mathematics | B. S. Grewal | Khanna Publication, New Dehli |
| Introductory Methods of Numerical analysis | S. S. Sastry | Prentice Hall Of India, New Dehli |
| Numerical methods for scientific & engineering computations | M. K. Jain & others | Wiley Eastern Publication. |

COMPUTER PROGRAMMING THROUGH 'C'

| Subject Code 1600302 | Theory | | | No of Period in one session :50 | | | Credits 03 |
|--------------------------------|-------------------------|---|-----|---------------------------------|---|-----|----------------------|
| | No. of Periods Per Week | | | Full Marks | : | 100 | |
| | L | T | P/S | ESE | : | 70 | |
| | 03 | — | — | TA | : | 10 | |
| | | | | CT | : | 20 | |

Rationale:

Computers play a vital role in present day life, more so, in the professional life of technician engineers. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various engineering applications of computers.

Objective:

The objectives of this course are to make the students able to:

- Develop efficient algorithms for solving a problem.
- Use the various constructs of a programming language viz. conditional, iteration and recursion.
- Implement the algorithms in “C” language.
- Use simple data structures like arrays, stacks and linked list solving problems.
- Handling File in “C”.

| Contents : Theory | | | Hrs/week | Marks |
|-------------------|--|--|-------------|-------|
| Unit -1 | <u>INTRODUCTION TO PROGRAMMING</u> The Basic Model of Computation, Algorithms, Flow-charts, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation. Programming Style-Names, Documentation & Format, Refinement & Modularity. | | [03] | |
| | | | | |
| Unit -2 | <u>ALGORITHM FOR PROBLEM SOLVING</u> Exchanging values of two variables, summation of a set of numbers. Reversing digits of an integer, GCD (Greatest Common Division) of two numbers. Test whether a number is prime. Organize numbers in ascending order. Find square root of a number, factorial computation, Fibonacci sequence. Compute sine Series. Check whether a given number is Palindrome or not. Find Square root of a quadratic equation. multiplication of two matrices, | | [08] | |
| | | | | |
| Unit -3 | <u>INTRODUCTION TO ‘C’ LANGUAGE</u> | | [08] | |
| | 03.01 | Character set, Variable and Identifiers, Built-in Data Types, Variable Definition, Declaration, C Key Words-Rules & Guidelines for Naming Variables. | | |
| | 03.02 | Arithmetic operators and Expressions, Constants and Literals, Precedence & Order of Evaluation. | | |
| | 03.03 | Simple assignment statement. Basic input/output statement. | | |
| | 03.04 | Simple ‘C’ programs of the given algorithms | | |
| Unit -4 | <u>CONDITIONAL STATEMENTS AND LOOPS</u> | | [07] | |
| | 04.01 | Decision making within a program | | |
| | 04.02 | Conditions, Relational Operators, Logical Perator. | | |
| | 04.03 | If statement, it-else statement. | | |
| | 04.04 | Loop statements | | |
| | 04.05 | Break, Continue, Switch | | |
| Unit -5 | <u>ARRAYS</u> What is an Array?, Declaring an Array, Initializing an Array. One dimensional arrays: Array manipulation: Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in array; Two dimensional arrays, Addition/Multiplication of two matrices. | | [07] | |
| | | | | |
| Unit -6 | <u>FUNCTIONS</u> Top-down approach of problem solving. Modular programming and functions, Definition of Functions Recursion, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Passing arguments to a Function: call by reference; call by value. | | [07] | |
| | | | | |

| | | | |
|----------------|---|-------------|--|
| Unit -7 | STRUCTURES AND UNIONS Basic of Structures, Structures variables, initialization, structure assignment, Structures and arrays: arrays of structures, | [04] | |
| Unit -8 | POINTERS Concept of Pointers, Address operators, pointer type declaration, pointer assignment, pointer initialization pointer arithmetic. | [06] | |
| Total | | | |

Text / Reference Books -

1. Programming with C. Second Edition. Tata McGraw-Hill, 2000 - Byron Gottfried
2. How to solve by Computer, Seventh Edition, 2001, Prentice hall of India. - R.G. Dromey
3. Programming with ANSI-C, First Edition, 1996, Tata McGraw hill. - E. Balaguruswami
4. Programming with ANSI & Turbo C. First Edition, Pearson Education. - A. Kamthane
5. Programming with C. First Edition, 1997, Tara McGraw hill. - Venugopla and Prasad
6. The C Programming Language, Second Edition, 2001, Prentice Hall of India. - B. W. Kernighan & D.M. Ritchie
7. Programming in C, Vikash Publishing House Pvt. Ltd., Jungpura, New Delhi. - R. Subburaj
8. Programming with C Language, Tara McGraw Hill, New Delhi. - C. Balagurswami
9. Elements of C, Khanna Publishers, Delhi. - M. H. Lewin
10. Programming in C. - Stephen G. Kochan
11. Programming in C, khanna Publishers, Delhi. - B. P. Mahapatra
12. Let us C, BPB Publication, New Delhi. - Yashwant kanetkar
13. Programming in C, Galgotia Publications Pvt. Ltd. Dariyaganj, New Delhi. - Kris A. Jamsa
14. The Art of C Programming, Narosa Publishing House, New Delhi. - Jones, Robin & Stewart
15. Problem Solving and Programming. Prentice Hall International. - A.C. Kenneth
16. C made easy, McGraw Hill Book Company, 1987. - H. Schildt
17. Software Engineering, McGraw Hill, 1992. - R.S. Pressman
18. Pointers in C, BPB publication, New Delhi. - Yashwant Kanetkar

ANALOG ELECTRONIC CIRCUIT

| Subject Code 1638303 | Theory | | | No of Period in one session : 50 | | | Credits 03 |
|--------------------------------|-------------------------|---|-----|----------------------------------|---|-----|--------------------------|
| | No. of Periods Per Week | | | Full Marks | : | 100 | |
| | L | T | P/S | ESE | : | 70 | |
| | 03 | — | — | TA | : | 10 | |
| | | | | CT | : | 20 | |

| Contents : Theory | | Hrs/week | Marks |
|-------------------|--|-----------|-------|
| Unit -1 | NOISE AND NOISE FIGURE IN AMPLIFIERS: Thermal noise, short noise, flicker noise Fiss formula. | [05] | |
| Unit -2 | POWER AMPLIFIERS: Classification of amplifiers and class-c, conversion efficiency complimentary symmetry amplifiers. | [07] | |
| Unit -3 | IDEAL AMPLIFIERS: Ideal voltage amplifier, ideal current amplifiers, ideal transresistance amplifier, ideal trans conductance amplifier, distortions, amplitude distortions, harmonic distortions, frequency distortions and phone distortion. | [07] | |
| Unit -4 | TRANSISTOR AMPLIFIERS: Multistage transistor amplifier, gain, frequency response, decibel gain, band with of a multistage amplifiers. Small signal amplifier and large signal amplifier, difference between voltage amplifier and power amplifier. Classification of power amplifier. Push-pull amplifier. | [12] | |
| Unit -5 | FEEDBACK AMPLIFIER AND OSCILLATORS: Feedback, concept of negative and positive feedback, considerations of gain. bandwidth, distortions etc with negative feedback Berkhaussian criterion for oscillations, colpitts oscillator, wein bridge oscillator. | [06] | |
| Unit -6 | H-PARAMETERS: Determination of h-parameters, h-parameters equivalent circuit, h-parameter of a transistor, Approximate hybrid formulae for Zi, Ai, Av and Zo. | [08] | |
| Unit -7 | Bootstrapping in emitter follower, Darlington pair cascade amplifier. | [05] | |
| Total | | 50 | |

Text / Reference Books -

| | | |
|--------------------------|---|---------------------------------------|
| Electronics | - | Miliman and Halkias |
| Principle of electronics | - | V.K.Mehta & S.Chand. (MCGRAW HILL) |

BASIC ELECTRONICS ENGINEERING

| Subject Code 1638304 | Theory | | | No of Period in one session : 50 | | | Credits |
|-------------------------|-------------------------|---|-----|----------------------------------|---|-----|---------|
| | No. of Periods Per Week | | | Full Marks | : | 100 | 03 |
| | L | T | P/S | ESE | : | 70 | |
| | 03 | — | — | TA | : | 10 | |
| | | | | CT | : | 20 | |

Rationale:

Electronics is a major part of our day to day life. In each and every field electronic systems are used. Basic electronics is one of the subjects which are the base of all advance electronics. It starts with PN junction which makes the student to follow the functioning of all semiconductor based electronics. This is a core group subject and it develops cognitive and psychomotor skills.

Objectives: Student will be able to:

- 1) Describe the formation of PN junction.
- 2) Draw the characteristics of basic components like diode, transistor etc.
- 3) Draw and describe the basic circuits of rectifier, filter, regulator and amplifiers.
- 4) Know voltage amplifiers.
- 5) Test diode and transistors.
- 6) Read the data sheets of diode and transistors.

| Contents : Theory | | Hrs/week | Marks |
|-------------------|---|-----------|-------|
| Unit -1 | Semiconductor Physics Semiconductor Bonds in Semiconductor and their application. Energy Band Description of Semiconductor Effects of Temperature on Semiconductors Intrinsic and Extrinsic Semiconductor n- type and p- type Semiconductor PN Junction, V – I Characteristics of p n junction and its properties | [08] | |
| Unit -2 | Semiconductor Diode Semiconductor diode Crystal diode as a rectifier Crystal diode rectifier and its kinds Efficiency of full wave rectifier Ripple factor Filter circuits and its types Zener diode | [08] | |
| Unit -3 | Special Purpose diodes LED and its advantage Photo diode, characteristics and its applications Tunnel diode, Varactor diode and its applications Shockley diode | [06] | |
| Unit -4 | Transistors Transistor Transistor as an amplifier Transistor connection (CB, CE, CC) Transistor load line analysis Operating point Cut off and Saturation points Semiconductor devices numbering system | [08] | |
| Unit -5 | Transistor Biasing Transistor biasing Stabilisation Stability factor Method of transistor biasing | [08] | |
| Unit -6 | Single Stage Transistor Amplifiers Single stage transistor amplifiers Phase reversal D.C. and A.C. equivalent circuits Voltage gain of CE Amplifier Classification of Amplifier | [08] | |
| Unit -7 | Feed back, -ve feed back, +ve feed back, oscillations, multistage amplifier (Fundamental idea only). | [04] | |
| Total | | 50 | |

ELECTRONIC MEASUREMENT - I

| Subject Code 1621305 | Theory | | | No of Period in one session : 50 | | | Credits |
|-------------------------|-------------------------|---|-----|----------------------------------|---|-----|---------|
| | No. of Periods Per Week | | | Full Marks | : | 100 | 03 |
| | L | T | P/S | ESE | : | 70 | |
| | 03 | — | — | TA | : | 10 | |
| | | | | CT | : | 20 | |

Rationale

Measurements are essential in every sphere. The subjects of Electronics and Tele-Communication Engineering are inseparably linked. Studies of Electrical and Electronic measuring instruments are incorporated in two papers, Paper-I and Paper-II.

Objectives

This paper mainly deals with the measurement of Current, Voltage, Power, Frequency and Phase beside the measurement of passive elements. The students are expected to be familiar with the principle, construction and uses of instruments utilized for these purposes.

| SL | Topics | Periods |
|-----|---|-----------|
| 1. | Characteristics of Instruments and possible errors. | 02 |
| 2. | Galvanometers | 04 |
| 3. | Ammeters, Voltmeters and Ohm Meters | 13 |
| 4. | Instruments Transformers | 04 |
| 5. | Power Measurement | 04 |
| 6. | Phase and Frequency Measurement | 05 |
| 7. | Resistance Measurement | 05 |
| 8. | Potentiometers | 04 |
| 9. | DC and AC Bridges | 04 |
| 10. | Cathode Ray Oscilloscope | 05 |
| | Total | 50 |

| Contents : Theory | | Hrs/week | Marks |
|-------------------|--|----------|-------|
| Unit -1 | Characteristics of Instruments and possible errors: Introduction to value, accuracy, precision, sensitivity, resolution, noise, repeatability, instrument efficiency, scale range, linearity, dynamic systems, dynamic response, and loading. Types of errors. | [02] | |
| Unit -2 | Galvanometers: D'Arranvol galvanometer, Torque equation, Dynamic behaviour, under damped, over damped and critically damped motion of galvanometer. sensitivity, choice of galvanometer, Flux meter. | [04] | |
| Unit -3 | Ammeters, Voltmeters and Ohm meters: Types of instruments. 03.01 Permanent Magnet Moving coil Instruments: Torque equation, Multi-range Ammeter, Voltmeters, Sensitivity, Loading effects, Advantages and Disadvantages. 03.02 Ohm Meters: Series and Shunt type Multimeter, Megger, 03.04 Moving Iron Instruments: Operating Principle, Torque equation, Electro-dynamometer, ammeter and voltmeters. Errors. Use in AC and DC. Use of these at high frequency. 03.04 Introduction to Electrostatics. Induction type and Rectifier type Instruments. | [13] | |
| Unit -4 | Instrument Transformer: Introduction to Instrument Transformer, Current Transformer and Potential Transformer in light of instrumentation. | [04] | |
| Unit -5 | Power Measurement: Power Measurement using instrument transformer. Wattmeters of different types. 3-phase Wattmeters. Energy meters for DC and AC circuits. | [04] | |
| Unit -6 | Phase and Frequency Measurement: Moving iron, Rotating field, Alternating field, Power Factor Meters. Types of Frequency Meters. | [05] | |
| Unit -7 | Resistance Measurement: Classification of Resistance, Measurement of medium resistance using ammeter, voltmeter, substitution and bridges. Construction for low resistance, Methods for measurement of low resistance using ammeter and voltmeter, Kelvin double bridge Measurement of high resistances: Difficulties and measurement, guard circuits, Direct deflection, loss of charge and mega ohm bridges methods of measurement. | [05] | |
| Unit -8 | Potentiometers: Classification, basic potentiometer, multi-range potentiometer, , Application of potentiometers. | [04] | |

| | | | |
|-----------------|---|-----------|--|
| Unit -9 | DC and AC Bridges: Basic principle of bridges. Wheatstone Kelvin Bridge, Maxwell bridges, Hay's bridges, Anderson's bridge. Measurement of inductance and capacitance using bridges. Wien's bridge, Universal bridge, Bridge circuits for measurement of mutual inductance. | [04] | |
| Unit -10 | Cathode Ray Oscilloscope: CRT, Deflection Systems, Synchronization, Time base circuits, Measurement of voltage, current, phase angle, frequency Lissajous pattern etc. | [05] | |
| Total | | 50 | |

Recommended Books

SL Title/Publisher

1. Electronic Instrument and Measurement Techniques
2. Course in Electrical and Electronic Measurement and Instrumentation
3. Electric and Electronics Measurement

Author

Cooper
A. K. Sawhny
Golding

COMPUTER PROGRAMMING THROUGH 'C' LAB

| Subject Code 1600306 | Practical | | | No. of Period in one session : 84 | | | Credits 03 |
|--------------------------------|-------------------------|---|-----|-----------------------------------|---|----|----------------------|
| | No. of Periods Per Week | | | Full Marks | : | 50 | |
| | L | T | P/S | ESE | : | 50 | |
| | — | — | 06 | Internal | : | 15 | |
| | | | | External | : | 35 | |

Rationale:

Computer Play a vital role in present day life, more so, in the professional life of technician engineer. In order to enable the students use the computer effectively in problem solving, this course offers the modern programming language C along with exposing to various engineering application of computers.

Objective

The objectives of this course are to make the students able to:

- Use the various constructs of a programming Language viz. Conditional Iteration and recursion
- Implement the algorithm in C language
- Use Simple data structures like arrays, stacks and Linked list solving problems.
- Handling file in C

Eight experiments to be performed in the laboratory:

| Contents : Practical | | Hrs/week | Marks |
|----------------------|---|----------|-------|
| Unit -1 | Programming exercise on executing a C program. | 12 | |
| Unit-2 | Programming exercise on case Control Statement. | 12 | |
| Unit-3 | Programming exercise on Decision Control Statement. | 12 | |
| Unit-4 | Programming exercise on looping. | 12 | |
| Unit-5 | Programming exercise on recursion technique. | 12 | |
| Unit-6 | Programming exercise on Structure. | 12 | |
| Unit-7 | Programs on array implementation. | 12 | |

Text / Reference Books -

- | | |
|--|---|
| 1. How to solve it by Computer, Prentice Hall of India, 1992. | - R.G. Dromey. |
| 2. The C Programming Language, Prentice Hall of India, 1989. | - B.W. Kernighan & D.M. Ritchie. |
| 3. The C Programming Language, Prentice Hall of India, 1989. | - Cooper, Mullish |
| 4. Application Programming in C. Macmillain International editions, 1990. | - Richa'd Johnson- Baugh & Martin Kalin |
| 5. The Art of C Programming, Narosa Publishing House, New Delhi. | - Jones, Robin & Stewart |
| 6. Problem Solving and Programming. Prentice Hall International. | - A.C. Kenneth. |
| 7. C made easy, McGraw Hill Book Company, 1987. | - H. Schildt |
| 8. Software Engineering, McGraw Hill, 1992. | - R.S. Pressman |
| 9. Programming in C, Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi | - R. Subburaj |
| 10. Programming with C language, Tata McGraw Hill, New Delhi. | - C. Balaguruswami |
| 11. Elements of C, Khanna Publishers. Delhi | - M. H. Lewin |
| 12. Programming in C | - Stephan G. Kochan. |
| 13. Programming in C, Khanna Publishers. New Delhi | - B.P. Mahapatra |
| 14. Let us C, BPB Publication. New Delhi | - Yashwant Kanetkar |
| 15. Programming in C, Galgotia Publications Pvt. Ltd. Dariyaganj, New Delhi. | - Kris A. Jamsa |

ANALOG ELECTRONICS CIRCUIT LAB.

| Subject Code 1638307 | Practical | | | No of Period in one session : | | | Credits 02 |
|-------------------------|-------------------------|---|-----|-------------------------------|---|----|---------------|
| | No. of Periods Per Week | | | Full Marks | : | 50 | |
| | L | T | P/S | ESE | : | 50 | |
| | — | — | 04 | Internal | : | 15 | |
| | | | | External | : | 35 | |

| Contents : Practical | | | |
|----------------------|---|----------|-------|
| Unit -1 | Wiring of RC coupled single stage FET amplifier and determination of the gain-frequency response, input and output impedances. | Hrs/week | Marks |
| Unit -2 | Wiring of RC coupled single stage BJT amplifier and determination of the gain-frequency response, input and output impedances. | | |
| Unit -3 | Wiring of BJT Darlington Emitter follower with and without bootstrapping and determination of the gain, input and output impedances (single circuit) (one experiment) | | |
| Unit -4 | Wiring and testing for the performance of BJT-RC phase shift oscillator for $f_o \geq 10$ KHz. | | |
| Unit -5 | Testing for the performance of BJT-Hatley and colpitts oscillators for RF range $f_o \geq 100$ KHz. | | |
| Unit -6 | Testing for the performance of BJT-crystal oscillators for $f_o \geq 100$ KHz. | | |
| Unit -7 | Testing of diode clipping (single/Double ended) circuits for peak clipping, peak detection. | | |
| Unit -8 | Testing of clamping circuits: positive clamping/negative clamping. | | |
| Unit -9 | Testing of a transformer less class-B push pull power amplifier and determination of its conversion efficiency. | | |
| Unit-10 | Testing of half wave, full wave and bridge rectifier circuits with and without capacitor filter. Determination of ripple factor, regulation and efficiency. | | |
| Unit-11 | Verification of Thevinin's Theorem and maximum power transfer theorem for DC circuit. | | |
| Unit-12 | Characteristics of Series and Parallel Resonant Circuits. | | |
| Unit-13 | Verification of Norton's theorem | | |
| Unit-14 | Verification of leads transistors. | | |

ELECTRONIC MEASUREMENT AND INSTRUMENTATION LAB

| Subject Code 1621308 | Practical | | | No of Period in one session : | | | Credits |
|--------------------------------|-------------------------|---|-----|-------------------------------|---|----|---------|
| | No. of Periods Per Week | | | Full Marks | : | 50 | 02 |
| | L | T | P/S | ESE | : | 50 | |
| | — | — | 04 | Internal | : | 15 | |
| | | | | External | : | 35 | |

Rationale

The study of this subject will help a student to gain the knowledge of working principles and operation of different electronic instruments (analog and digital). The practical work done in this subject will help to acquire skills in operation and testing of instruments as per their specifications.

Contents : Practical

| LIST OF PRACTICALS:- | | Hrs/week | Marks |
|----------------------|---|----------|-------|
| Unit -1 | Conversion of Galvanometer into Ammeter and Voltmeter. | | |
| Unit -2 | Calibration of Ammeter, Voltmeter and Wattmeter. | | |
| Unit -3 | Determination of Inductance, Capacitance using AC bridges. | | |
| Unit -4 | Use of AC potentiometer, chokes, resistance model. | | |
| Unit -5 | To observe the loading effect of a multi-meter while measuring voltage across a low resistance and high resistance. | | |
| Unit -6 | Measurement of voltage, frequency, time period and phase angle using Cathode Ray Oscilloscope (CRO). | | |
| Unit -7 | Measurement of time period, frequency, | | |
| Unit -8 | Measurement of rise, fall and delay times using a Cathode Ray Oscilloscope. | | |
| Unit -9 | Measurement of R, L and C using a LCR bridge/Universal bridge. | | |
| Total | | | |

BASIC ELECTRONICS ENGINEERING - TW

| Subject Code 1638309 | Term Work | | | No of Period in one session : | | | Credits |
|--------------------------------|-------------------------|---|-----|-------------------------------|---|-----|---------|
| | No. of Periods Per Week | | | Full Marks | : | 100 | 02 |
| | L | T | P/S | Internal | : | 10 | |
| | — | — | 03 | External | : | 20 | |

| Contents : Term Work | | Hrs/week | Marks |
|----------------------|---|----------|-------|
| Unit -1 | Forward & Reverse characteristics of diode | | |
| Unit -2 | Forward & Reverse characteristics of Zener diode | | |
| Unit -3 | Study of Rectifiers a) Half wave b) Full wave | | |
| Unit -4 | Study of filter circuits. a) Capacitor Filter b) Inductor filter. | | |
| Unit -5 | Input & output characteristics of transistor in CE mode | | |
| Unit -6 | Input & output characteristics of transistor in CB mode | | |
| Unit -7 | Characteristics of FET | | |
| Unit -8 | Characteristics of UJT | | |
| Unit -9 | Zener diode Regulator | | |
| Unit -10 | Transistor series and shunt regulator | | |
| Total | | | |

Books:

| Sl.No. | Author | Title | Publisher |
|--------|--|-------------------------------------|------------------------|
| 01 | N.N.Bhargava, D.C. Kulashreshtha, S.C. Gupta -TTTI Chandigharh | Basic Electronics & Linear Circuits | Tata McGraw Hill |
| 02 | Alberrrt Malvino David J.Bates | Electronic Principles | Tata McGraw Hill |
| 03 | Allen. Mottershead | Electronic Devices & Components' | Prentice Hall of India |
| 04 | NIIT | Basic Electronics & Devices | Prentice Hall of India |
| 05 | Grob Bernard | Basic Electronics | Tata McGraw Hill |
| 06 | David J. Bell | Electronics Devices & Circuits | Prentice Hall of India |
| 07 | V.K.Mehta & Rohit Mehta | Principles of Electronics | S.Chand |