

GOVT.V.Y.T.P.G.AUTO.COLLEGE, DURG (C.G.)
SYLLABUS FOR 2016–2017
B.Sc.-I (Electronics)
PAPER-I ELECTRONIC DEVICES & PASSIVE CIRCUIT

Max. Marks 50

UNIT-1

Physics of semiconductors: Basic idea of crystal structure and energy band, simple idea of effective mass, carrier concentration at normal equilibrium in an intrinsic semi-conductor, Fermi level for intrinsic semiconductor. Donors and Acceptors, Physical picture of electrons and holes as majority carriers, dependence of Fermi level on acceptor concentration. Law of mass action ($n_p * p_p = N_i^2$).

UNIT-2

Basic derivation of the relation between carrier concentration mobility and electron charge from ohm's law, idea of drift and diffusion, simple idea of Hall Effect. p-n junction, Barrier formation, current components in equilibrium under open circuit, derivation of barrier potential and current voltage characteristic, of the resistance p-n junction diode and its variation with biasing. Definition of transition capacitance, capacitance voltage relationship for an abrupt p-n junction diode.

Basic idea and working of varactor diode, solar cell, LED, shocktly diode, tunnel diode, zener diode and qualitative mechanism of breakdown.

UNIT-3

PNP and NPN TRANSISTORS (Eber-moll model), Definition of alpha, beta and gamma and derivation of relationship between them, basic of junction capacitance.

The construction and working of JEET, the idea of channel width, field dependent mobility showing current dependence of voltage, physical explanation of different region of I-V Curves, various parameters of JEET.

UNIT-4

MOS Devices-Basic structure and energy level diagram, definition of work function, electron affinity, surface potential and difference between intrinsic Fermi level and Fermi level of doped semi conductor, physical explanation of the formation of accumulation, depletion and inversion region under an external bias, the idea of band accumulation, the idea of band bending (assume that E_f remain fixed).

Basic construction of MOSFET and its working, physical explanation of the characteristics curve in enhancement and depletion modes, MOSFET Parameters.

UNIT-5

Basic idea of the impedance of L, C, and R, representation of L and C in presence of loss (non ideal). Transformer and its equivalent circuit, mutual inductance, qualitative idea of magnetic core. Qualitative idea of steady state and transient response. Network analysis (resistive and reactive). Network: definition, loop and nodal analysis, principle of duality reduction of complicated network. T and Pi network, conversion between T and Pi(Π) section, Superposition theorems, Norton's theorem, Maximum power transfer theorem, definition of Z, Y, H, G Transmission (A, B, C, D parameters) for two ports network, inter-relationship of these parameters.

REFERENCE-

1. Principle of electronics-V.K.Mehta
2. Solid State Electronics: B.L. Thareja
3. Handbook of electronics-Gupta& Kumar
4. Unified course on electronics devices &circuits:vol.II-Agrawal&Agrawal

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SYLLABUS FOR: (2016–2017)

B.Sc.-I (Electronics)

PAPER-II LINEAR ACTIVE CIRCUITS

Max. Marks 50

UNIT-1

P-N Junction diode characteristics curve, static and dynamic resistance of diode, Avalanche breakdown and zener effect. Half wave, full wave and bridge rectifiers. Ripple factor and power conversion efficiency of these rectifiers. Uses of zener diode in power supplies as regulator. Filter circuits' series inductor, shunt capacitor, π -section filters, clipping and clamping circuits.

UNIT-2

CHARACTERISTIC Curve of transistor in CB, CE, CC Mode. Relation between α , β , Y of a transistor Biasing (fixed and self), stabilization, stability factor and its derivation, method of transistor biasing (1) base register method (2) voltage divider bias. Transistor as a CE amplifier, load line analysis, operating point, d.c load line, active, cutoff and saturation region.

UNIT-3

Two port representation (black box) analysis of transistor circuit hybrid equivalent circuit or CE, CB, CC mode.

Small signal amplifier; derivation of voltage gain, current gain, input impedance output impedance, R.C. coupled amplifier, derivation of half power point for its frequency, idea of band width. Negative voltage and current feedback in amplifier, its gain and advantages.

UNIT-4

Tuned amplifier: difference between tuned amplifier and other amplifier, analysis of parallel resonant (tuned) circuit, Its characteristics like-factor advantage of tuned amplifier. Single tuned amplifier and its analysis with a.c equivalent circuit in CE mode. Cascading (double) tuned amplifier, tuned class c amplifier power amplifier, analysis and design. Consideration of push pulls amplifiers.

UNIT-5

Positive feed back amplifier –Oscillator, barkhausen criterion .analysis of LC and phase shift oscillator, Hartley and Wienbridge oscillator.

Operational Amplifiers: Requirement of an ideal OP-AMP: Basic idea of common mode gain. Difference gain, common mode rejection ratio. Application of OP-Amps as inverting and non inverting amplifier, adder and subtractor, integrator and differentiator.

REFERENCE-

- (1) Principle of electronics V.K.Mehta
- (2) Unified course on electronics devices & circuits: vol.II-Agrawal & Agrawal

GOVT.V.Y.T. P.G. AUTONOMOUS COLLEGE,

DURG (C.G.)

SYLLABUS FOR 2016–2017

PRACTICAL

B.Sc.-I Electronics

List of Experiments:

1. Study of electronic components and analog multimeter.
2. Determination of energy band –gap of a diode.
3. Study of P-N Junction Diode Characteristics,
4. Study of Zener diode characteristics.
5. Study of tunnel diode characteristics.
6. Study of the clamping and clipping circuits.
7. Study of LED Characteristics.
8. Study of Transistor characteristics in Common Base Mode (CB).
9. Study of Transistor characteristics in Common Emitter Mode (CE).
10. Study of Transistor bias stability.
11. Study of Emitter follower (measurement of input output, impedance and gain).
12. Study of Frequency response of a single CE amplifier (make your own circuit)
13. Study of Field Effect Transistor Characteristics.
14. Study of R-C coupled Amplifier And Draw The frequency response Curve.
15. Verification of nortons theorem.
16. Verification of super position theorem.
17. Verification of Thevenins theorem.
18. Verification of maximum power transfer theorem.
19. Study of Series and parallel resonance circuits.
20. Measurement of capacitance and resistance combination using LCR Bridge.

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SYLLABUS FOR(2016–2017)

B.Sc. – II (Electronics)

PAPER–I DIGITAL ELECTRONICS

Max. Marks 50

UNIT – I

Number system: binary numbers, binary to decimal conversion, decimal to binary conversion, binary addition, binary subtraction, 1's compliment, 2's compliments, binary multiplication and division, octal and hexadecimal numbers, BCD code and gray code. Logic gates: OR, AND, NOT, NAND, NOR, Ex-OR, Ex-NOR GATES, positive and negative logic, universal building blocks.

UNIT – II

Boolean Algebra:- De Morgan's theorem, laws and theorems of Boolean algebra, sum of product and product of sums simplification, Karnaugh map simplification.

Arithmetic Circuits: Half and full adders, half and full subtractors, binary adders, 8421 adders, 2's compliment adder subtractor.

UNIT – III

Logic families: Various logic families RTL, DTL, TTL, ECL, MOS I²L. (MOS) and their characteristics, basic gates used in these families, flip flops, JK flip flops, positive and negative edge triggered flip flops, JK master slave flip flop, idea of astable and monostablemultivibrators.

UNIT – IV

Registers and Counters: Data register, shift registers, synchronous counter, and ripple counter, up – down counter, ring counter, decade counter, A/D and D/A converters: Basic D/A converters, Ladder method, counter method of A/D counter.

UNIT – V

Memories: Volatile and non volatile memories, ROM, PROM, EPROM, and RAM, dynamic and static RAM Floppy Disk. Microprocessor: introduction to a microprocessorand popular digital IC's of 8085 family. INTEL 8085 A- Architecture and pin out diagrams, the program, CPU, Processing of Instruction inside a CPU, Timing in CPU, CPU used in a system, Instruction set for 8085 microprocessor.

REFERENCES:

1. Digital electronics by R.P. Jain.
2. Digital electronics by Filloyd.
3. Digital Electronics & Application by Y.D. Sharma &Shipra Sharma.
4. Microprocessor by Vibhute.
5. Microprocessor by Gaonker.
6. Fundamental of Microprocessor by B. Ram.

GOVT.V.Y.T.P.G.AUTO. COLLEGE, DURG
SYLLABUS FOR(2016–2017)
B.Sc. – II(Electronics)
PAPER – II, ELECTRONIC INSTRUMENTS

Max. Marks 50

UNIT – I

Regulated power supplies: power supply characteristics, zener regulator, series voltage regulator, series regulator with pass transistor to large load currents, shunt regulator, idea of Darlington pair, Regulator with Op- amp, inverting, non- inverting, amplifiers, Zener reference, IC regulated circuits (IC 78XX series). Regulator features: Current Limiting, short circuit protection, fold back, precision regulator.

UNIT – II

CRO: Block diagram, basic operation, electro static focusing, electrostatic deflection, screen for CRT, horizontal deflection system, Sweep generator, Synchronizing the wave vertical deflection system vertical amp., Lissajous figures, frequency and phase measurement, introduction to storage CRO, dual trace dual beam, sampling CRO.

UNIT – III

Signal Generators: Sweep frequency Generator, pulse and square wave generator, pulse characteristic and terminology, astable multivibrator, block diagram of pulse generation function, 555 timer for frequency generation, Blocking Oscillator wave generator, Introduction to IC 8038 as complete function generator.

UNIT – IV

Q-Meter - Basic circuit, measuring methods, direct series and parallel connections, source of errors, Electronic voltmeter, D.C. voltmeter, direct coupled amplifier And chopper type. D.C. amplifier, A.C. voltmeter, true RMS reading voltmeter, multirange voltmeter sensitivity. Power meter: single phase, double phase and three phase watt meter, watt hour meter. Digital Voltmeter: LED's digital display, seven segment display, integrating DVM, Ramp DVM, sample and hold circuits.

UNIT – V

Analog/Digital Multimeter: Analog multimeter, AC and DC measurement, conversion of analog output to digital form (A/D), Dual ramp A/D converter, digital measuring system multimeter, block diagram, voltage, current and resistance measurements.

Frequency Counter: Elements of electronic counter, decade counting assembly temperature compensated crystal oscillator, universal counter, measurement modes, frequency measurement, period measurement, time interval measurement.

REFERENCES:

1. Electronics & Electrical Measurement Instruments by A.K. Sawhney.
2. Principles of electronics by V.K. Mehta.
3. Modern Electronic Instrumentation and Measurement Techniques by Albert D. Helfrick, William D. Cooper

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SYLLABUS FOR 2016–2017

PRACTICAL

B.Sc. –II Electronics

List of Experiments:

1. Verification of Truth table of basic logic gates.
2. Verification of De Morgan's theorem.
3. Study of half adders and full adders using IC's
4. Study of RS flip-flops.
5. Study of D and T type flip flop.
6. Study of JK master slave flip flop.
7. Study of Simple power supply.
8. Study of regulated power supply using zener diode.
9. Study of IC regulated power supply.
10. Study of LC oscillator.
11. Study of Transistor phase shift oscillates.
12. Frequency and phase measurement with CRO.
13. Study of frequency by Wien Bridge.
14. Study of IC OP-AMP application, viz. adder, subtractor.
15. Study of IC OP-AMP application, viz. integrator, differentiator.
16. Study of OP Amp: Inverting and non-Inverting amplifiers of different gains.
17. Study of astable multivibrator using 555 timer.
18. Study of bistable multivibrator using 555 timer.
19. Study of 8083 based function generator.
20. Study of A/D Converter
21. Study of D/A Converter.

GOVT.V.Y.T.AUTO.PG COLLEGE, DURG (C.G)
SYLLABUS FOR: (2016-2017)
Class: B.Sc. III(Electronics)
PAPER -I INDUSTRIAL ELECTRONICS

Min.Marks :17

Max.Marks-50

UNIT-1

Thyristors: Principles and operations of SCR, Voltage amplifier gate characteristics of SCR, Characteristics of two transistor models, Thyristor construction, Rectifier circuit using SCR, GTO, Operation and characteristics of DIAC, TRIAC, Silicon Controlled Switch, Silicon Unilateral Switch, Silicon Bilateral Switch, and Light activated SCR. Turn ON/OFF Mechanism: Basics of turn on and turn off methods.

UNIT-2

Applications of SCR: Multiple connections of SCR, Series operation, Triggering of series connected SCR, Parallel operation, Triggering of parallel connected SCR, SCR di/dt calculation, Snubber circuit, dv/dt calculation across SCR, Types of converters, Full wave controlled rectifier with resistive load, FWCR with inductive load, FWCR with free wheeling diode .

UNIT-3

Inverters: Types of inverters, Single phase bridge inverter, Mc Murray impulse commutation inverter, Single phase half bridge voltage source inverter, Single phase full bridge voltage inverter, Step down choppers, Step up choppers, Chopper classification.
Other Applications: Induction heating, Resistance welding, Over voltage protection, Zero voltage switch, SMPS, UPS, DC circuit breaker, Battery charger, AC static switch, DC static switch, Time delay, Fan regulator using TRIAC .

UNIT-4

PCB Fundamentals: PCB Advantages, components of PCB, Electronic components, IC's, Surface Mount Devices (SMD). Classification of PCB - single, double, multilayer and flexible boards, Manufacturing of PCB, PCB standards.

Schematic & Layout Design: Schematic diagram, General, Mechanical and Electrical design considerations, Placing and Mounting of components, Conductor spacing, routing guidelines, heat sinks and package density, Net list, creating components for library, Tracks, Pads, Vias, power plane, grounding, Lead cutting and Soldering Techniques, Testing and quality controls. PCB Technology Trends, Environmental concerns in PCB industry.

UNIT-5

Analog/Digital Multimeter : Analog multimeter, AC and DC measurement, conversion of analog output to digital form (A/D), Dual ramp A/D converter, digital measuring system, multimeter block diagram,

voltage, current and resistance measurements. Frequency counter : Elements of electronic counter, decade counting assembly temperature compensated crystal oscillator, universal counter, measurement modes; frequency measurement, period measurement, time interval measurement, measurement errors : gating errors, time base error, trigger level error.

REFERENCE BOOKS:

1. Ramamourthy “ Thyristor and their applications” East-West Publishers, 2nd Edition
2. Shamir K Datta “ Power Electronics and Controllers” PHI, 3rd Edition
3. Power Electronics: Devices, Circuits and Industrial Applications.
4. V.R. Moorthy Oxford University Press; First Edition edition.
5. Printed circuit Board – Design & Technology by Walter C. Bosshart, Tata McGraw Hill.
6. Printed Circuit Board –Design, Fabrication, Assembly & Testing by R.S.Khandpur, TATA McGraw Hill Publisher
7. Electronics Instrumentation H.S.Kalsi McGraw Hill Education; 3 edition (1 July 2017)
8. Modern Electronic Instrumentation and Measurement Techniques Albert Helfrick and William D Cooper Prentice Hall India Learning Private Limited
9. Electronic Instrumentation and Measurements David A. Bell Oxford University Press India; Third edition (12 April 2013)

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SYLLABUS FOR: (2016-2017)

B.Sc-III (Electronics)

PAPER-II MOBILE APPLICATION PROGRAMMING AND INTRODUCTION TO VHDL

Min.Marks :17

Max.Marks-50

UNIT-1

Introduction: What is mobile Application Programming, Different Platforms, Architecture and working of Android, iOS and Windows phone 8 operating system, Comparison of Android, iOS and Windows phone 8.

Android Development Environment: What is Android, Advantages and Future of Android, Tools and about Android SDK, Installing Java, Eclipse, and Android, Android Software Development Kit for Eclipse, Android Development Tool: Android Tools for Eclipse, AVDs: Smartphone Emulators, Image Editing.

UNIT-2

Android Software Development Platform: Understanding Java SE and the Dalvik Virtual Machine, Directory Structure of an Android Project, Common Default Resources Folders, The Values Folder, Leveraging Android XML, Screen Sizes, Launching Your Application: The AndroidManifest.xml File, Creating Your First Android Application

Android Framework Overview: The Foundation of OOP, The APK File, Android Application Components, Android Activities: Defining the User Interface, Android Services: Processing in the Background, Broadcast Receivers: Announcements and Notifications, Content Providers: Data Management, Android Intent Objects: Messaging for Components, Android Manifest XML: Declaring Your Components.

UNIT-3

Views and Layouts, Buttons, Menus, and Dialogs, Graphics Resources in Android: Introducing the Drawables, Implementing Images, Core Drawable Subclasses, Using Bitmap, PNG, JPEG and GIF Images in Android, Creating Animation in Android

Handling User Interface (UI) Events: An Overview of UI Events in Android, Listening for and Handling Events, Handling UI Events via the View Class, Event Callback Methods, Handling Click Events, Touchscreen Events, Keyboard Events, Context Menus, Controlling the Focus.

UNIT-4

Content Providers: An Overview of Android Content Providers, Defining a Content Provider, Working with a Database

Intents and Intent Filters: What is an Intent, Implicit Intents and Explicit Intents, Intents with Activities, Intents with Broadcast Receivers

Advanced Android, New Features in Android 4.4,

iOS Development Environment: Overview of iOS, iOS Layers, Introduction to iOS application development

Windows phone Environment: Overview of windows phone and its platform, Building windows phone application.

UNIT-5

Introduction to VHDL: Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. VHDL Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format.

VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behavior, process statements, process execution, sequential statements, architecture selection, configuration statements

REFERENCE BOOKS:

1. Beginning Android 4, Onur Cinar, Apress Publication
2. Professional Android 4 Application Development, Reto Meier, Wrox
3. Beginning iOS 6 Development: Exploring the iOS SDK, David Mark, Apress
4. Beginning Windows 8 Application Development, István Novák, Zoltan Arvai, György Balássy and David Fulop.
5. Professional Windows 8 Programming: Application Development with C# and XML, Allen Sanders and Kevin Ashley, Wrox Publication
6. Programming with Mobile Applications: Android, iOS, and Windows Phone 7 , Thomas Duffy, Course Technology, Cengage Learning 2013

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SYLLABUS FOR (2016-2017)
Practical & Project
B.Sc. - III Electronics

List of Experiments:

1. Study of SCR characteristics.
2. Study of Diac and Triac characteristics.
3. Study of UJT characteristics.
4. Study of UJT as a relaxation oscillator.
5. Study of AM generation and detection.
6. Radio receiver measurements.
7. Study of low pass, band pass and high pass filters.
8. Study of FM using voltage controlled oscillator.
9. Study of Choppers.
10. Study of pulse code modulation.
11. Study of electronic regulation of D.C&A.C motors.
12. Study of the decade counter as MOD-3 and MOD-4 and verify the truth table.
13. Study of the decade counter as MOD-8 and MOD-9 and verify the truth table.
14. Study of seven segment Display.
15. Study of Binary Counter.
16. Addition of two binary numbers with microprocessor (8085).
17. Subtraction of two binary numbers with microprocessor (8085).
18. Multiplication of two binary numbers with microprocessor (8085).
19. Division of two binary numbers with microprocessor (8085).
20. Data transfer from memory to register and vice versa using 8085 microprocessor.