Mahakaushal University, Jabalpur (M.P.)

MAHAKAUSHAL UNIVERSITY
JABALPUR| MADHYA PRADESH | INDIA

Scheme & Syllabus

For

Diploma

in

Electronics & Communication Engineering

2021-2022 onwards

Duration of Course: 3 Years
Examination Mode: Semester
Examination System: CBCS

Mahakaushal University
Village-Aithakheda, Mukunwara Road, Post- Tilwara Jabalpur (M.P.) 482003

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Communication Skills

UNIT – I **Marks :14**

COMMUNICATION PROCESS AND ITS NEEDS

How to make communication effective, Barriers in communication, Removal of barriers. Grammar and vocabulary for correct English usage. Determiners, Prepositions, Auxiliary verbs and subject- Verb agreement, Rewrite as directed (change voice, correct form of verbs/ tenses), Vocabulary – Oneword substitution, words often misused and wrongly spelt.

UNIT – II **Marks :14**

PASSAGES OF COMPREHENSION

Prescribed passages (six from existing syllabus), Language of Science, Desalination or Desalting Process, Safety Practices, Non-conventional Sources of Energy, Our Environment, Entrepreneurship, Writing summary, moral and characterization of any one story from the book prescribed.

UNIT – III **Marks :14**

BUSINESS COMMUNICATION

Principles of effective business correspondence Its parts, mechanics, styles and forms., Application for job, Bio-Data and C.V., Letter of Enquiry, Placing order, Complaint

UNIT – IV **Marks :14**

COMPOSITION & TRANSLATION

Writing paragraphs of 150 words on topics of general interest i.e. pollution, ragging college, importance of computers, importance of communication skill, importance of science and technology etc., Translation (Hindi to English and vice- versa).

UNIT – V **Marks :14**

UNSEEN PASSAGES & PRECIS WRITING

Answer the questions based on the passage. Give suitable title, Writing Précis.

Reference Books

1. English Conversation Practice, Grant Taylor.
2. Practical English Grammar, - Thomson & Martinet.
3. Communication Skills for Technical Students Book– I, Book – II, M/S Somaiya Publication, Bombay.
4. Living English Structure, S. Allen.
5. English Grammar, Usage, and Composition, Tickoo & Subramanian, S. Chand & Co. Standard Allen Longman.
6. Essentials of Business Communication, Dr. Rajendra Pal & J.S. Korlahalli S.Chand & Sons, New Delhi.
7. Effective Business Communication, M.V. Rodriques, Concept Pub. Co. New Delhi.
8. Communication for Business, Shirely Taylor, Longman, England.
9. Communication for Engineers and Professors, P. Prasad, S.K.Kataria and sons publications, New Delhi.
10. Technical English Book-II, Somaya Publications, New Delhi.

Physics

UNIT – I **Marks :14**

UNITS & MEASUREMENT: Fundamental and derived units, Scalar and vector, Basic requirements to represent vector, Symbols, abbreviation, and proculation, Linear measurement by vernier calipers, screw gauge and spherometer Angular measurement by angular vernier, MOTION: Motion and its type, Linear motion (laws and equation), Circular motion, Angular velocity and relation with linear velocity, Centripetal acceleration, Centripetal and Centrifugal forces Rotatory motion, Axis of rotation, Moment of Inertia, Radius of gyration, Kinetic energy of rotation, Numerical Problems and solution on the topic.

UNIT – II **Marks :14**

MOLECULAR PHENOMENON OF SOLIDS, LIQUIDS AND GASES: Postulates Of Molecular Kinetic Theory of Structure of Matter, Brownian motion, Kinetic and Potential energy of molecules, Kinetic theory of gases, Postulates, Calculation of pressure by Kinetic theory, Prove of different gases law by Kinetic theory. **PROPERTIES OF MATTER**: Elasticity: Meaning, definition, stress, stain, Hook's law and elastic limit, Surface Tension : Meaning, definition, molecular forces, cohesive and adhesive forces, surface energy, capillary rise and capillary rise method.Viscosity : Meaning, definition, stream line and turbulent flow, critical velocity, Stock's law. Numerical problems and solution on the topic.

UNIT – III **Marks :14**

HEAT: Heat and temperature, concept of heat as molecular motion, Transmission of heat, study state and variable state. Concept of heat capacity, specific heat and latent heat. Calorimeter and its uses, Thermodynamics , Relation between heat and work, Mechanical equivalent of heat, First law of thermodynamics and its application, Second law of thermodynamics and its application. Carnot cycle, Numerical problems and solution on the topic. Heating effect of current and thermoelectricity: Heating effect of electric current: Joule's law, work energy and power in electric circuit, calculation of electric energy. Thermo electricity, See back effect and thermoelectric power. Neutral temperature, emperature of inversion and relation between them, Thermo electric thermometer and thermo couples. Numerical problems and solution on the topic.

UNIT – IV **Marks :14**

SOUND: Production of sound waves(Longitudinal and transverse waves), Progressive and stationary waves, Basic knowledge of refraction , reflection, interference and diffraction. Ultrasonic, Audible range, Production of ultrasonic, properties and uses, **OPTICS AND OPTICAL INSTRUMENTS**: Refraction, critical angle and total internal reflection, refraction, through lenses and problems, Power of lenses, Spherical and chromatic aberrations, Simple and compound microscope, telescope and derivation for their magnifying power, Numerical problems and solution on the topic.

UNIT – V **Marks :14**

ELECTROSTATICS AND ELECTROMAGNETIC INDUCTION: Coulomb's law, Electric field intensity, potential. Capacity, principle of capacitor, types of capacitor, combination of capacitors. Electromagnetic Induction: Faradav's law. Lenz's law. Self and mutual inductance, Transformer and electric motor, Induction coil. **MODERN PHYSICS: BASIC ELECTRONICS**: Photoelectric effect, threshold frequency, Einstein- equation, Photo electric cells, Radioactivity : decay constant, Half life.

mean life, Properties of nucleus, nuclear mass, mass defect, Production of x-rays, properties and its uses, Thermal emission, semiconductors, Types of semiconductors, Explanation of conductor, semiconductor and insulators on the basis of band theory, P-N junction, diode as rectifier.

Reference Books

1. Applied Physics Vol. 1 & 2, Saxena and Prabhakar.
2. Physics, - Ttti Publication.
3. Physics Vol. 1 &2, Halliday and Resnic R.
4. Engineering Physics, - Gaur and Gupta.
5. Principle of Physics, Brij Lal & Subramanyan.
6. Physics for Technical Education, LS Zednov.

List of Experiments

1. Refractive index of prism (I-d) curve
2. Refractive index of prism (spectrometer)
3. Focal length of a convex lens by u-v method
4. Focal length of a convex lens by displacement method
5. Verification of Ohm's law
6. To find out unknown resistance by meter bridge
7. To find out internal radius of hollow tube by vernier calipers.
8. To find out volume of given cylinder by screw gauge.
9. Surface tension by Capillary rise method.
10. Coefficient of viscosity
11. Coefficient of Thermal conductivity by searl's method.
12. Verification of Newton's cooling law.

Chemistry

UNIT – I **Marks :14**

ATOMIC STRUCTURE AND RADIOACTIVITY : Discovery of electron, proton ,neutron and nucleus. Ruther ford's and Bohr's model of anatom. Bohr Burry scheme of filling the electrons in various orbits. Idea of s,p,d,f orbital.Alfa, Gamma and Beta rays, theory of radio activity, Group displacement law, half life period, numerical problems on half life period, fission and fusion.

SURFACE CHEMISTRY AND ITS APPLICATION: True solution, colloidal solution and suspension, lyophobic and lyophillic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions.

ELECTROCHEMISTRY: Electrolysis, Faraday's laws of electrolysis, Numerical problems on Faradays Law, electroplating of copper and nickel.

COLLIGATIVE PRPOPERTIES: Osmosis & osmatic pressure, Relative vapour pressure and Routls law. Internal energy (enthalpy) Entrophy, Entrophy fusion free energy, Effect of change in temperature catalysis.

UNIT – II **Marks :14**

CHEMICAL BONDING AND CATALYSIS: Bonding: Nature of bonds- Electrovalent, Co-valent, co-ordinate and hydrogen bond. Catalysis : Types , theory characteristic, positive , negative, auto and induced catalyst. Catalytic Promoter, and catalytic inhibitors. Industrial Application of catalysis.

WATER: Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful - effects of hard water in boiler. Municipal water supply. Numerical on soda lime process. Determination of hardness of water by O. Hener's, EDTA and soap solution method.

UNIT – III **Marks :14**

METALS AND ALLOYS : Physical and chemical properties of metals, copper, iron, aluminum, tin, nickel. General principal of metallurgy, minerals/ ores, ore dressing, roasting ,smelting, bassemerisation, fluxes, purification . Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy. Ionization, Ph value corrosion and protection: Arhenius theory of ionization, factors affecting ionization. pH meaning (numerical), Buffer solutions and Buffer actions, choice of indication (acidimetry and alkalimetry). Explanation of corrosion, types of corrosion, factors effecting corrosion, corrosion control (protection against corrosion), metal and organic coating for corrosion control.

UNIT – IV **Marks :14**

GLASS, CEMENT AND REFRACTORY: Glass: Basic raw materials for glass, composition and manufacture of glass, varieties of glass and annealing of glass, Cement : Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement. Refractories : Meaning, characteristics , use of common refractory materials.

HIGH POLYMERS, RUBBER AND INSULATORS: Polymerization and condensation, classification of plastics, Compounding and Moulding constituents of plastics. Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters, Bakelite. Synthetic fibers - nylon, rayon, terylon, and polyesters. Definition characteristics , classification and properties of insulators, glass, wool and thermocole. Idea about rubber and vulcanization.

UNIT – V

Marks :14

LUBRICANTS, PAINTS AND VARNISHES: Lubricants: Meaning , type and theory of lubricants, properties of a good lubricants, Flash, and fire point and cloud point, emulsification number, viscosity. Paints and Varnishes : Meaning, ingredients and characteristics of good paints and varnishes, their engineering applications.

FUELS, FIRE EXTINGUISHERS AND EXPLOSIVES : Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter , octane and octane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation . Fire extinguishers - Description and use. Explosives - Meaning, types, characteristic and use of explosives. Name Dynamite, lead azide, T.N.T., Picric acid, R.D.X. Pollution and control: Introduction and chemical toxicology, air and water pollution, control of air and water pollution. Harmful effect of different gases like carbon mono-oxide, carbon dioxide, sulphur dioxide, nitric oxide, nitrous and lead.

Reference Books

1. Physical Chemistry, Bahl and Tuli
2. Inorganic Chemistry, Satyaprakash
3. Modern Text Book of Applied Chemistry, Dr. G. C. Saxena, Jain Prakashan, Indore
4. Applied Chemistry, Dr. G. C. Saxena, Deepak Prakashan, Gwalior
5. Applied Chemistry, Shrivastava & Singhal, Pbs Publication, Bhopal
6. Engineering Chemistry, Uppal
7. Engineering Chemistry, – Rao And Agarwal
8. Engineering Chemistry, P.C. Jain
9. Polymer Chemistry, O.P. Mishra
10. Applied Chemistry, H.N. Sahni, Deepak Prakash

List of Experiments

1. To identify one Anion and Cation in a given sample.
2. Determination of flesh point and fire point of a given sample of oil by Abel's apparatus.
3. Determination of viscosity by Red Wood Viscometer no. 1 and no.2.
4. Redoximetry Titration :
   a. Percentage of Iron in given sample of alloy.
   b. Determination of strength of ferrous ammonium sulphate.
   c. Determination of strength of anhydrous ferrous sulphate and ferrous sulphate.
5. Determination of hardness of water by :
   a. EDTA Method and Soap Solution Method
6. Determination of solid content in the given sample of water.
7. Determination of percentage of moisture in the given sample of coal by proximate analysis.

Mathematics

UNIT – I **Marks :14**

ALGEBRA: Permutation- Meaning of factorial n, Permutation of 'n' dissimilar thing taken 'r' at a time. Combination Combination of n dissimilar things taken 'r' at a time, Binomial Theorem, Statement of the theorem for positive integer General Term, Middle term, Constant term, Partial Fractions, Define a proper-improper fraction, Break a fraction into partial fraction whose denominator contains Linear, Repeated linear and Non repeated quadratic factors. Determinant, Concept & principles of determinants, Properties of determinant, Simple examples. Complex Numbers, Algebra of Complex

UNIT – II **Marks :14**

TRIGONOMETRY : Allied angles. Trigonometrical ratios of sum and difference of angles, (Only statement), Sum and difference of trigometric ratios (C-D formula), Multiple angles (Only double angle and half angle), Properties of triangle (without proof).

MATRIX : Definition of Matrix. Types of Matrix. Row, Column, Square, Unit, Upper and lower triangular, Symmetric & Skew Symmetric, Singular and non Singular Matrices. Adjoint of a Matrix. Inverse of a Matrix.

UNIT – III **Marks :14**

CO-ORDINATE GEOMETRY : Co-ordinate System : Cartesian and Polar. Distance, Division, Area of a triangle. Locus of a point and its equation. Slope of St. Line, Angle between two St. lines. Parallel and perpendicular St. lines. Standard and general equation of St. line. Point of intersection of two st lines.

STATISTICS : Measures of Central tendency (Mean, Mode, Median), Measures of Dispersion (Mean deviation, standard deviation).

UNIT – IV **Marks :14**

DIFFERENTIAL CALCULUS : Define constant, variable, function. Value of the function. Concept of limit of a function. Definition and concept of differential coefficient as a limit. Standard results. Derivatives of sum, difference, product, quotient of two functions. Diff coeff. of function of a function. Diff. coeff. of implicit function. Logarithmic Differentiation. Differential coeff. of Parametric function.

UNIT – V **Marks :14**

INTEGRAL CALCULUS : Definition as a inverse process of differentiation, Standard Results (including inverse function), Methods of Integration, Substitution, Integration by parts, Breaking up into partial fraction, Concept of Definite Integral.

VECTOR ALGEBRA : Concept of Vector and Scalar Quantities. Different types of vectors. Addition and subtraction of vectors. Components of a vector, Multiplication of two vectors: Scalar Product, Vector Product, Applications (Work done, power & reactive power).

Reference Books

1. Differential Calculus, Gorakh Prasad.
2. Integral Calculus, Gorakh Prasad.
3. Co-ordinate Geometry, S.L. Loni.
4. Engineering Mathematics, Dr. S.K. Chouksey & Manoj Singh.
5. Mathematical Statistics, Ray and Sharma.
6. Higher Engineering Mathematics, B.S. Grewal.

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Applied Machanics

UNIT – I **Marks :14**

COMPOSITION AND RESOLUTION OF FORCES

Definition , Effect, characteristics of force,System of Forces,Principle of Transmissibility of Forces, Concept of Resultant Force,Law of –Parallelogram of Forces, Triangle of Forces, Polygon of Forces, Determination of Resultant of two or more concurrent forces (analytically andgraphically)

PARALLEL FORCES AND COUPLES

Classification of Parallel Forces, Methods of finding resultant Force of parallel forces- analytically & graphically,Position of resultant force of parallel forces- Definition, Classification and characteristics of a force Couple, moment of couple

UNIT – II **Marks :14**

MOMENTS AND THEIR APPLICATIONS

Definition, Types and law of moment-Varignon's Principle of moment and its applications Lever and its Applications. Types of supports and determination of support reactions of a simply supported beam subjected to point load and uniformly distributed load (UDL).

EQUILIBRIUM OF FORCES

Equilibrium of a system of concurrent forces, Conditions and types of Equilibrium Lami's Theorem and its applications.

UNIT – III **Marks :14**

CENTRE OF GRAVITY

Difference between Centroid and Center of Gravity (CG), Centroid of standard plane figures and CG of simple solid bodies, Method of finding out Centroid of composite plane laminas and cut sections, Method of finding out CG of Composite solid bodies.

FRICTION

Concept and types of friction, Limiting Friction, coefficient of friction, angle of friction, angle of repose, Laws of friction (Static and Kinetic), Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane,Utility / Nuisance value of friction.

UNIT – IV **Marks :14**

SIMPLE LIFTING MECHINES

Concept of lifting Machines, Definition of Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation Reversibility of Machines and condition for self locking machine, Law of Machines, Maximum mechanical advantage and maximum efficiency of machine, Friction in machine (In terms of Load and effort), Calculation of M.A., V.R. and efficiency of following machines, Simple wheel and axle Differential wheel and axle Single purchase crab Double purchase crab Simple screw jack. Different System of simple pulley blocks.

MOTION OF A PARTICLE

Definition of speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration, Motion under constant acceleration/ retardation (equations of motion) Motion under force of gravity, Concept of relative velocity, Definition of projectile, velocity of projection , angle of projection,

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time of light, maximum height, horizontal range and their determination, Definition of angular velocity, angular acceleration and angular displacement, Relation between linear and angular velocity of a particle moving in a circular path,Motion of rotation under constant angular acceleration.

UNIT – V **Marks :14**

LAWS OF MOTION

Newton's Laws of motion and their applications.

WORK, POWER AND ENERGY

Definition unit and graphical representation of work, Definition and unit of power and types of engine power and efficiency of an engine. Definition and concept of Impulse, Definition, unit and types of energies, Total energy of a body falling under gravity.

Reference Books

1. A text book of Applied Mechanics – R.S. Khurmi , S.C. Chand & Co. , New Delhi
2. Applied Mechanics – I.B. Prasad, Khanna Publishers, New Delhi
3. Applied Mechanics (Hindi) – R.S. Jog, Anand Publishers, Gwalior Applied

List of Experiments

1. Verification of laws of parallelogram of forces.
2. Verification of laws of polygon of forces
3. Verification of laws of moments
4. Determination of forces in the members of Jib Crane
5. Determination of Centroid of plane lemina by graphical method
6. Determination of coefficient of friction for surfaces of different materials on horizontal plane
7. Determination of coefficient of friction for surfaces of different materials on an inclined plane Determination of mechanical advantage, velocity ration and efficiency of the following lifting machines.
8. Simple wheel and axle Differential wheel axle Single purchase crab Double purchase crab Simple pulley block Simple screw jack
9. Measurement of B.H.P. of an engine using roap break dynamometer

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Environmental Engineering and Safety

UNIT – I — Marks :14

INTRODUCTION TO ENVIRONMENT.

The Biosphere, biotic and abiotic, An aquatic ecosystem, Types of pollution, Impact of human being on environment, Impact of environment on human being, Basic approach to improve environmental qualities, Roll of an environmental engineer.

AIR POLLUTION SOURCES AND EFFECTS.

Standard definition of air pollution, Composition of natural air, Names of air pollutants, Classification of air pollutants, primary and secondary pollutants, Classification of source of air pollutants on different bases, Definition of different types of aerosols, Effect of air pollution on: human health, material properties, vegetation, Major toxic metals and their effects, Major environmental phenomenon e.g., acid rain, global warming, green house effect, ozone layer depletion, Air quality standards, Brief description of air pollution laws.

UNIT – II — Marks :14

METEOROLOGICAL ASPECTS OF AIR POLLUTANT DISPERSION.

Meteorological parameters influencing air pollution, Environmental laps rate, temperature inversion, atmospheric stability and adiabatic loss rate, Turbulence, topographical effects, Plume behavior, looping, coning, fanning fumigation, lofting , trapping.

AIR POLLUTION CONTROL METHODS AND EQUIPMENTS.

Natural purification processes of air,Artificial purification methods of air, Brief description of following control equipments along with sketch e.g, gravitation settling chamber, cyclone, scrubber, bag house filter, electrostatic precipitator, Brief description of following processes for the control of gaseous pollutants e. g., absorption, adsorption, condensation, combustion etc.

UNIT – III — Marks :14

WATER POLLUTION SOURCES AND CLASSIFICATION.

Water resources, Uses of water, Classification of water,Origin, composition and characteristics of domestic waste water as well as industrial waste water, Biochemical oxygen demand, Water pollution laws and standards, Uses of waste water,Classification of waste water, Chemical oxygen demand.

WASTE WATER TREATMENT METHOD.

basic processes of water treatment. Meaning of primary, secondary and tertiary treatment.Flow chart of a simple effluent treatment plant, Theory of indusrial waste treatment,Volume reduction, neutralization and proportioning.

UNIT – IV — Marks :14

SOLID WASTE MANAGEMENT.

Sources and classification of solid waste, Public health aspects, Disposal methods – open dumping , sanitary, land fill. Incineration , compositing, Potential methods of disposal. Recovery and recycling of paper, glass, metal and plastic.

NOISE POLLUTION AND CONTROL.

Sources of noise pollution, Units of Noise pollution measurement, Allowable limits for different areas, Problems of noise pollution and measures to control it, Noise pollution control devices brief discussion.

UNIT – V

Marks :14

SAFETY PRACTICES

Responsibility of employees and employers regarding health and safety, Fire hazards ,prevention and precautions, Industrial hazards prevention and protection, Protection from air and noise pollution.

Reference Books

1. Environmental pollution control Engineering by C.S. Rao.
2. Air pollution and control by Seth.
3. Air pollution by M.N Rao.

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Introduction to Computers

UNIT – I **Marks :14**

INTRODUCTIONTO COMPUTERS

Basic Concepts-Generations of Computers Overview of computer Systems Classifications of Computers Characteristics of Computes Applications of Computers. Numbers System & Codes-Decimal, Binary, Octal, Hexadecimal Conversions from one system to other Binary Coded Decimal & ASCII Code. Computer Hardware: Input Devices-Keyboard, Mouse, Trackball, Joystick, Scanner, OMR OCR Bar-Code Reader, MICR, Digitizer, Card Reader, Voice Recognition, Web Cam, Video Cameras, Etc. Output Devices-Monitors, Printers : Dot matrix, Inkjet & Laser, Plotters, Commuter, Output Micro Film (COM), Multimedia Projector, Speech Synthesizsr, Dumb, Smart & Intelligent Terminal.Storage Devices

UNIT – II **Marks :14**

Primary and Secondary Storage- Characteristics and Limitation, Floppy, Hard disk, CD ROM DVD, Disk Cartridge. Microprocessor-Registers, Arithmetic Unit, Control Unit, Buses, Instruction Set, Processor Speed.,Memory Concepts. Concept of Memory-Unit of Memory, Types of Memory, RAM,ROM, PROM, EPROM, EEPROM, Cache Memory. Computer Software-System Software Vs Application Software, Operating System Programs, Language Processor, Assembler, Compiler & Interpreter,Application Software, Types of Application Software and their examples., High Level Language, Low Level Language, Assembly Language. Multimedia-Basics of Multimedia,Components- Text, Graphics, Animation, Audio, Images & Video. Multimedia Applications.

UNIT – III **Marks :14**

OPERATING SYSTEM

Overview of DOS- Internal Commands, External Commands. Windows Operating System-Overview of different versions of Windows Characteristics and Facilities of Windows, Terminologies of Windows – Desktop, Icon, Menu etc. Components of Desktop. Working with Files and Folders. Windows Utilities and Accessories – Notepad, WordPad, Paintbrush, Windows Explorer, Calculator. Introduction to Linux- An overview of Linux, Basic Linux elements System, Features Software, Features File structure, Linux H/W & S/W requirements.

UNIT – IV **Marks :14**

WORD PROCESSING

Saving, Closing, Opening of documents, Selecting text Editing text, Finding and replacing text\ Printing documents, Merge Documents. Character and paragraph Formatting, Page Design and layout. Spell Check, Creating Tables and Charts. Handling Graphics

SPREADSHEET PACKAGE

Spreadsheet concept – Need, advantage, Terminology like cell, row, column etc. Working with Spreadsheet– Creating, Saving, Editing and printing, Entering data – Entering number, text, date, time etc. Selecting cells – Cut, copy, paste date, Editing Worksheet data. Formatting – Text and Cells, Applying border shading, background patterns, conditional formats, positioning cells, formatting numbers, text, Date, time. Creating formulas- Entering, Editing, Using Functions, Controlling calculations. Working with Charts- Creating charts, Adding & changing text, changing the view and display, types of charts. Presentation Software: Introduction Presentation design tools Presentation terminologies. Creating,

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Opening and Saving Presentation. Working with different views Creating and Organizing slides, Adding and Formatting text in slides Formatting paragraphsm Adding drawings and objects Creating special effects Working with table and charts Printing Presentation.

UNIT – V

Marks :14

DATABASE

Introduction – need, Characteristics and terminologies of database, Types of database – relational, Hierarchical and Network. Basic entities – Tables, records, Data types, Data, Validation and constraints, keys relation between tables. Query – Select, Insert, Update, Delete. Forms – Creating forms, Forms controls Report Designer- Customize formats, grouping reports. Computer Communication & Networks: Information Networks- The Technology of Workgroup Computing, Types of network, Network topology.Network components. Data Communication-Introduction to Data Communication,Types of Data,Transmission media. Internet and E-mail- Internet Basics, Websites- Applications, terminologies, naming conventions., Web Browsers- Types, Navigation and tools, E-mail – concept, terminologies, mailing services provider, advantages comparison with Conventional mailing. Search engine – concept, search engine websites, searching methods.

Text Books

1. S . Jaiswal, A First Course in Computers, Golgotha Publication
2. Slotnick, Butterfield, Colantonio and Kopetzky, Computers & Application, C.C. Health & Company
3. Ron Mansfield, The Complete Guide to Microsoft Office Professional, Sybex /BPB Asian Edition
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia

Reference Books

1. Suresh K. Basandra, Computers Today, Galgotia Publication
2. Norton Peter, Inside IBM PC
3. Computer Hardware, Osborne Series
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia
6. Chapman, Understanding windows, BPB Publication

List of Experiments

1. Study of various components of computer like CPU, keyboard, mouse, monitor, printer, CVT and storage devices.
2. Internal and external commands of DOS.
3. Using Windows operating system, study of desktop, control panel, accessories and settings.
4. File management in windows explorer, Study of WordPad, NotePad, PaintBrush, Calculator etc. Study of Linux operating system.
5. Study of MS-word – opening and saving of documents, formatting, editing and spell check, find and replace, printing, merging. Creating Table, Charts and Graphics.
6. Study of Spreadsheet – creating, saving, editing and printing. Entering data, selecting cells, formatting text, applying border shades and backgrounds, creating formulas, creating charts.
7. Study of Power Point – creating, opening, editing and saving of slides. Adding and formatting text, creating, animations, working with images and special effects. Printing presentation.
8. Study of MSAcess– creating, saving, editing and printing of tables. Managing relationships, writing queries e.g. SELECT, UPDATE, DELETE, INSERT. Forms designing and report printing.
9. Study ofWeb Browser and mailing programs.

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Engineering Drawing

UNIT – I

Marks :14

INTRODUCTION TO DRAWING INSTRUMENTS:

Introduction of drawing instruments, materials and their uses, Applications of minidrafter Applications of compass and divider Applications of French curves and spline Pencils grades and their uses, Designation and sizes of drawing sheet and drawing board.

PLANNING AND LAYOUT OF DRAWING SHEET:

Planning of drawing sheet as per I.S.: 696-1972 (SP 46: 1988). This should include- Margin, Title Block, Zoning, Revision panel, Folding marks, Numbering of sheet.

CONVENTIONAL REPRESENTATION:

Conventional representation of the following as per BIS practice.Common Engineering materials

Electrical installations and fittings – Main switches, (lighting and power), socket outlets (3 pin 5AMP, 3pin15AMP), bell, buzzer, loud speaker, Aerial, ceiling fan, exhaust fan, Bracket fan, fan regulator, battery and earth point.

Electronics components- Diode: Zener, varactor, Scotty, step recovery, light emitting diode (LED), PNP and NPN transistors, résistance, capacitor, Inductors (fixed and variable both), IC
(8pin and 14pin), SCR, TRIAC, DIAC, UJT, FET, MOSFET, LOGIC GATES.

Sanitary fittings- showerhead, wall lavatory basin, corner Lavatory basin, urinal stall, kitchen sink, Indian type WC, Water closets (Asian pan, urissapan, Anglo-Indian, European)

Building -single and double swing doors and windows.

Mechanical components- Internal and external threads, slotted head, Square end and flat, radial arms and ribs, serrated shaft, splined shaft, Chain wheel, bearing, straight and diamond knurling,
Compression and tension spring, leaf spring (with and without eye), Spur and helical gear.

LINES, LETTERING AND DIMENSIONING:

Introduction of type of lines and their applications, Single stroke vertical, inclined letters (capital and lowercase) And numerals. Dimensioning: Elements of dimensioning- dimension line,
extension line, arrowhead And leader line. Dimensioning system – Aligned and unidirectional. Dimensioning of Arcs and Circles. Angular Dimensioning.Dimension of counter sunk and counter bore.

UNIT – II

Marks :14

GEOMETRICAL CONSTRUCTIONS AND ENGINEERING CURVES

Divide a line into any number of equal parts by parallel line method, Bisecting of line and angle. Construction of triangles and polygons Introduction of conic sections (curves), Construction of Ellipse by Eccentricity and Concentric circles methods, Construction of Parabola by Eccentricity and Rectangle methods, Construction of Hyperbola by Eccentricity method, Construction of Cycloid, Construction of Involutes of circle and polygon, Construction of Archemedian Spiral of any number of convolutions.

SCALES:

Introduction of scales and their applications, Concept of reducing, enlarging and full size scale Classification of scales – plain, diagonal, vernier, Scale of chord and comparative scales, Definition of R.F. Construction of plain and diagonal scales.

UNIT – III Marks :14

THEORY OF PROJECTION AND PROJECTION OF POINTS, LINES AND PLANES

Definition of various term associated with theory of projection- Planes of projection, Quadrants, first & third angle projection method, Projection of points in all the four quadrants. Projection of linesparallel to HP and VP both, perpendicular to one plane and parallel to other, Inclined to one plane and parallel to other, knowledge of projection of line inclined to both the plane, (No practice required).

Projection of planes – Perpendicular to HP and VP both, Perpendicular to one plane and parallel to other, Inclined to one plane and perpendicular to other, Knowledge of projection of plane inclined to both the planes.

UNIT – IV Marks :14

PROJECTIONS OF SOLIDS:

Projection of cylinder, cone, prism and pyramid. Under the conditions :- Axis parallel to HP and VP, Axis perpendicular to HP and parallel to VP, Axis perpendicular to VP and parallel to HP, Axis inclined to HP and parallel to VP, Axis inclined to VP and parallel to HP, Axis inclined to both HP and VP.

SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES:

Section of cone, cylinder, prism and pyramid (Solid resting on its base in the HP i.e. the Axis perpendicular to HP and parallel to VP) in the cases:- Section plane parallel to HP and perpendicular to VP, Section plane parallel to VP and perpendicular to HP, Section plane inclined to HP and perpendicular to VP, Section plane inclined to VP and perpendicular to HP. Drawing True shape of section.

Introduction to development of lateral surface of solids- Cone, Cylinder, Prism and Pyramids (Simple and truncated). Under the condition – solid resting on its base in the HP and axis Perpendicular to HP and parallel to VP. Development of funnel and elbow.

INTERSECTION OF SURFACES

Intersection of following cases – Cylinder to cylinder and Prism to prism (With their axis intersecting and perpendicular to each other.)

UNIT – V Marks :14

ORTHOGRAPHIC PROJECTIONS & FREE HAND SKETCHING:

Principles of orthographic projections- Identification of necessary views and superfluous view Selection of front view. Preparation of necessary orthographic views of simple objects From given pictorial views. Dimensioning of orthographic views as per standard practice. Free hand sketches of simple objects (Using Pencil, Eraser & Paper only)

ISOMETRIC VIEWS

Concept of isometric projection and isometric view (Isometric Drawing), Construction of isometric scale, Construction of isometric view of polygon and circle, Construction of isometric view of cone, cylinder, prism and pyramids, Construction of isometric view of simple objects from given orthographic views.

List of Practical:

Sketching and drawing of geometries and projections based on above syllabus

Text Books

1. ENGINEERING DRAWING – N.D. Bhatt
2. ENGINEERING DRAWING – R.K. Dhawan
3. ENGINEERING DRAWING – P.S.Gill

Reference Books

1. ENGINEERING DRAWING – P.S.Gill
2. SP: 46-1988 Bureau of Indian standard
3. PRINCIPLES OF ELECTRONICS - Malvino

MAHAKAUSHAL UNIVERSITY JABALPUR

Workshop Practics

PURPOSE

To provide the students with hands on experience on different trades of engineering like fitting, carpentary, smithy, welding and sheet metal.

INSTRUCTIONAL OBJECTIVES

To familiarize with

1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.

Text Books

1. Gopal, T.V., Kumar, T., and Murali, G., A first course on workshop practice – Theory, practice and work book, Suma Publications, 2005.

Reference Books

1. Kannaiah,P. & Narayanan,K.C. Manual on Workshop Practice, Scitech Publications, Chennai, 1999.
2. Venkatachalapathy, V.S. , First year Engineering Workshop Practice, Ramalinga Publications, Madurai, 1999.

List of Experiments

1. EMPHASIS TO BE LAID ON REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.
2. FITTING Tools & Equipments – Practice in Filing and Drilling. Making Vee Joints, Square, dovetail joints, Key Making.
3. CARPENTARY Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.
4. SHEET METAL Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.
5. WELDING Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet.Demonstration of Gas welding, TIG & MIG.
6. SMITHY Tools and Equipments –Making simple parts like hexagonal headed bolt, chisel.

MAHAKAUSHAL UNIVERSITY JABALPUR

ELECTRONIC COMPONENTS & MATERIALS

Unit I

Conductors and Insulators: Introduction, Atomic Structure, band structure of solids, energy band diagram of conductors, semiconductors and insulators, reliability specifications for electronic components, stability, drift, catastrophic failure, MTBF, MTTF, resistivity / conductivity as a basic material property, conductivity / resistivity of different types of materials , effect of temperature on conductivity, low, medium & high resistivity materials, Classification of insulating materials, properties & applications of Insulating materials, Difference among conductor, insulator and semiconductors based on: atomic structure, band theory, Role ofsemiconductors in making semiconductor devices.

Unit II

Magnetic Materials: Introduction, Properties of magnetic materials, Permeability, B-H curve and hysteresis effect, curies temperature, Residual magnetism, Factor affecting the properties of magnetic materials such as: over temperature, mechanical damage, and direction of current, Classification of magneticmaterials such as: hard and soft magnetic materials, Dai, para, ferro & ferrite magnetic materialsJointing and Cleaning Materials: Jointing techniques, Screw jointing, Soldering and welding, Types of screw heads, screw shafts, Soldering: Types of solders (soft & hard), soldering process, Different soldering materials used in electronics, Adhesives. Cleaning Materials: IPA (Isopropyl alcohol), CTC (Carbon tetra chloride), Acetone etc.

Unit III

Cells and Batteries: Principle of a cell , theory of operation , concept of Ideal voltage and current source, Internal resistance, Ampere hour rating, Primary and secondary cells and batteries.
Types of primary cells: carbon - zinc, mercury oxide, silver oxide , lithium. Types of secondary cells; Lead storage battery , Solar cells, Primary and Secondary cells & batteries, Maintenance requirements for various batteries, Choice of batteries for different applications.

Unit IV

Relays and Switches: relay Characteristics, relay performance, Contact types, Specifications and applications of different types of relays.
Switches: Types of manually operated switches, their features and applications,
Manually operated Selector Switches, Keyboards and sensing switches; their principle of operation and applications, Types, Operation, and applications of electrically operated switches.

Unit V

Connectors and Packages: level of connections, generic types and specifications of connecting devices for connection levels 2,3 and 4, ratings and specifications of connectors, types of Connectors , Factors affecting choice of connectors; choice of connectors for different applications.

References:

1. Electrical Engineering Materials by TTTI , Madras
2. Electrical Engineering Materials by Indulkar and Tiruvenkadam
3. Electrical Engineering Materials by M.L.Gupta.
4. Electrical Engineering by P.L.Kapoor

MAHAKAUSHAL UNIVERSITY JABALPUR

ELECTRONIC DEVICES AND CIRCUIT

Unit-I

PN Junction Diodes: Basic Structure and symbol, Forward & Reverse Biasing, V-I Characteristic, Various application of Junction Diode, Special purpose Diodes, Constructional features, symbol and applications of Zener Diode, Tunnel Diode, Schottky Diode,Varactor Diode, Photo Diode, LED, Switching Diode.

Unit-II

Diode Circuits: Need of rectification, Types of rectifier: Half Wave, Full Wave and Bridge rectifier, Comparison, Average, Peak and rms Values, Filter Circuits, Need of Filter Circuits, Types of filter circuits: shunt capacitor, L- type and pie type, Ripple factor, Bleeder Resistance, Rectifier with filter, Basics ofVoltage multiplier, Clipping Circuit, Clamping circuit.

Unit-III

Junction Transistors: Bipolar Junction Transistor (BJT), Basic Structure, Types: PNP & NPN transistors Transistor action, Transistor Configuration: CE, CC and CB mode, V -I characteristics: Input and Output Characteristics, Regions of Transistor operation, active, saturation & cutoff, Expression for currents: Alpha (α) and Beta (β), relation between alpha & beta, Transistor as a Switch, Transistor Biasing : fixed bias, Base Bias, Emitter feedback Bias, Collector feedback Bias, Voltage divider Bias, Emitter Bias, transistor specifications, FET: Types of FET, Compare FET with BJT, FET operation, V -I characteristics, FET applications, Structural diagram of UJT, working of UJT, Applications of UJT in relaxation oscillator and blocking oscillator.

Unit-IV

Amplifiers: Transistor as an Amplifier, CE Amplifier, Cascading of Amplifier, Meaning & necessity of cascade amplifier, Circuit Diagram of cascade amplifier with transistor coupling: RC coupling, Direct Coupling, Transformer coupling, Classification of Amplifiers: Class A, class B, class AB & class C amplifier, Distortion in amplifiers: Amplitude or Non linear distortion, Frequency Distortion, Phase shift distortion, Frequency response of amplifier, Feed Back Amplifier, Importance & concept of Feed Back, Advantage of negative feedback, block diagram of a feedback amplifier, Darlington Pair, Power Amplifiers, Audio Power Amplifier, Push pull Amplifier, Phase Splitter.

Unit-V

Oscillator: Principle of Oscillator, Barkhausen circuit criteria for oscillation, Types of Oscillators- Phase shift oscillator, Resonance – Circuit LC oscillator, Wein Bridge oscillator, Colpitt's Oscillator, Hartley Oscillator, Crystal Oscillator.

Multivibrators: Basic form of operation, Astable (free running) multivibrator, Monostable (Single shot) multivibrator, Bistable (Trigger) Multivibrator.

References:

1. Electronic Devices & Circuits By Robert Boylestad
2. Electronic Devices and Circuits by Millman & Halkias
3.Electronic Devices and Circuits by Mathur&Chadha

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List of Experiments

1. To plot the V-I characteristics of a –
(a) Silicon Diode
(b) Germanium Diode
2. To verify the action of diode as a positive clipper and negative clipper.
3. To verify the action of diode as a positive clamper and negative clamper.
4. To verify the V-I characteristics of Zener Diode.
5. To obtain the input and output Transistor Characteristics for CB configuration.
6. To obtain the input and output Transistor Characteristics for CE configuration.
7. To obtain the input and output Transistor Characteristics for CC configuration.
8. To verify the operation of FET as a switch.
9. To verify the V-I Characteristics of UJT.
10. To setup the circuit and verify the waveforms of
    (i) HW rectifier
    (ii) FW (centre tapped) rectifier
    (iii) Bridge rectifier
11. To observe the output waveform of a rectifier circuit with
    (i) capacitor filter
    (ii) L-inductive filter
12. To observe the performance (frequency response) of a CE amplifier.
13. To observe the performance (frequency response) of an emitter follower amplifier.
14. To determine the overall voltage gain and frequency response of two stage cascade amplifier.
15. To analyze the performance of a class A amplifier.
16. To observe the characteristics of
    (i) current series feedback amplifier
    (ii)voltage series feedback amplifier.
17. To setup a RC phase shift oscillator and analyze its operation.
18.To verify the action of UJT as a relaxation Oscillator.

MAHAKAUSHAL UNIVERSITY JABALPUR

BASIC ELECTRICAL ENGINEERING

Unit-I

Laws of Basic Electricity: energy, nature of electricity, electric circuits and diagrams, the international system of units, scientific notation and engineering prefixes, current and Voltage, the coulomb, the ampere, potential difference, conventional current, Ohm's law of constant proportionality, Define resistance, types of resistance ,Factors governing resistance, Dependence of resistance upon temperature, voltage, magnetic field, light, pressure and their typical applications, non linear resistors, series and parallel combination of resistance, equivalent resistance, work and power, energy and work efficiency, kilowatt-hour, interrelationship of basic electrical units.

Unit-II

Magnetic Fundamentals: magneto motive force, reluctance, permeability, flux density,
Magnetic field intensity, magnetic materials, magnetization curves, Hysteresis, magnetic effect of electric current, electromagnetic induction, eddy current, magnetic shielding.
AC Fundamentals: Concepts of alternating voltage and current, Difference between AC and DC voltage, Concepts of Cycle, Frequency, Period, Amplitude, Instantaneous value, average value, RMS value, Peak value and form factor, the radian, Graphical representation of different periodic waves (signals),Relation of V&I Phasors in RL, RC and RLC series circuit, Representation of sine waves on Phasor diagrams, Impedance and admittance, impedance triangle, Concepts of real (Watt), reactive (VARs) and apparent power (VA) and power triangle.

Unit-III

Transformers: use of transformer (Electronics & Electrical), definition of transformer, Principle of working of transformer, construction of transformer, Classification based on core construction, elementary theory of an ideal transformer, EMF equation of a transformer, Voltage transformation ratio(K) and Impedance ratio, Elementary Knowledge of Special Types of transformers- Auto transformer, Ferrite core type, Potential Transformer (PT) and Current transformer (CT).

Unit-IV

DC Machine: Basic Working Principles of D.C. Generator and Motors, comparison of generator and motor action, significance of Generated emf and Back emf and their voltage equations, Different types of DC motor. Basic methods of speed control of a DC motor, Basic motor characteristics- Torque vs Armature current ,Speed vs Armature current, Speed vs Torque, Application of DC motor in electronics and electrical.

Unit-V

AC Machine: Types of ac machines, construction of motor, Basic working principle of operation, production of rotating magnetic field, Basic knowledge of slip in induction motors. Torque-slip characteristic of inducton motor, Basic methods of speed control of induction motor, construction of a single phase induction motor, Elementary Knowledge of different types of single phase induction motor, Their applications in industries & households.
Electrical Safety Measure: Need of earthing, Protection against electric shocks.

References:

1. Electrical technology – Volume I & II by B.L.Theraja
2. Fundamentals of Electrical Engineering Technology by V. Deltero.
3. Basic Electricity by Van Valkenberg

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List of Experiments

01. Identify various resistances and understand their specifications.
02. Identify various capacitors and understand their specifications.
03. Familiarization of Digital Multimeters and Analog Multimeters.
04. Measure hot and cold resistance of filament of electric bulb.
05. Verification of Ohms law.
06. Series and parallel combination of resistance.
07. Measurement of single phase power by using Wattmeter, Ammeter and Voltmeter.
08. Series resistive-capacitive (R-C) circuits.
09. Series resistive -inductive (R-L) circuits.
10. Series resistive inductive and capacitive (R-L-C) circuits.
11. Demonstrate various transformer and understand their specifications.
12. Extending the range of basic meter movement:
    (a) Meter Multipliers
    (b) Meter shunts
13. Study of fan regulator circuit (Resistive & Electronic).
14. Study of tube light circuit.
15. Speed control of DC shunt motor:
    (a) By varying field current-armature voltage kept constant.
    (b) By varying armature voltage – field current constant.

MAHAKAUSHAL UNIVERSITY JABALPUR

NETWORK ANALYSIS

Unit-I

Network Transformation: Introduction, Topology-Definitions, Nodes, Branches, Tree, Co-Tree, Twings, Tie-Set, Cut-set, Indices Matrix, Reduced Indices Matrix, KVL analysis ,KCL analysis, Mesh and node circuit analysis, Principle of duality, Reduction of complicated network, Conversion between T and π (pie) Section, Superposition Theorem, Reciprocity Theorem, Thevenin's Theorem, Norton's Theorem, Millman's Theorem, Maximum Power transfer theorem, Mutual Impedance and their dot conversion, Delta and Wye (Y)Transformation.

Unit-II

Resonance: Quality Factor or Q- Factor, Series Resonance, Resonance frequency, Bandwidth and Selectivity of Series resonance circuit, Parallel Resonance or Anti Resonance, Resonance frequency, Band Width and Selectivity of Parallel Resonance circuit, Phasor diagrams for L-C, R-L, R-C and R-L-C Circuits.

Steady State & Transient Response: Analysis of step and sinusoidal inputs, Steady state & transient response for RL Circuit, RC Circuit, forced and unforced response.

Unit-III

Filters: Introduction, Decibel & Neper- Definitions, Classification of Filters according to Pass & Stop Bands, Constant K Low pass filter, Constant K High pass filter, Band pass and band elimination filter, Elementary m- Derived filter, Elementary Composite Filters.

Unit-IV

Two Port Network & Their Parameters: Short Circuit, Admittance parameters, Open circuit Impedance parameters, Z parameters, Y Parameters, Hybrid Parameters, Transmission Parameters, Inverse transmission Parameters, Introduction to Image impedance, Symmetric Network, Ladder network, Bridge 'T' network, Parallel 'T' network, Lattice network

Attenuators: types of attenuators, Basics of Equalizers and types.

Unit-V

Laplace Transformation: Initial condition in elements, A procedure for evaluating initial condition, The Laplace transformation, Laplace transform of elementary function, Application of Laplace transform for transient and steady state behavior of RL ,RC and RLC circuits.

References:

1. Network Lines by Umesh Sinha
2. Network Lines and Fields by Ryder
3. Network Analysis by G. K. Mithal

List of Experiments

1. Familiarization of CRO.
2. Familiarization of Function Generator.
3. Pass band check of low pass, high pass, band pass & band stop filters.
4. To study and Verify Superposition theorem.
5. To study and Verify Reciprocity theorem.
6. To study and Verify Thevenin's theorem.
7. To study and Verify Norton's theorem.
8. To study and Verify KCL AND KVL.
9. Series resonance circuit.
10. Parallel resonance circuit.

MAHAKAUSHAL UNIVERSITY JABALPUR

DIGITAL ELECTRONICS

Unit-I

Number System and Binary Codes: Binary, Hexadecimal, Octal, Decimal and their inter conversion, 1's complement, 2's complement numbers, 9's complement & 10's complement, Introduction to Binary codes, Weighted, Non Weighted codes, Excess 3 code, Grey code, BCD code, Hamming code.

Boolean Algebra & Logic Gates: Introduction to Boolean Algebra, Law of Boolean Algebra, De Morgan's theorem, Simplification of Boolean functions with Boolean laws, Karnaugh Map method, simplification ofBoolean equation using K-Map (up to four variables)

Unit-II

Logic Families: Introduction to logic families, DTL, ECL,TTL, C-MOS and their comparison on the basis of their characteristics, Familiarization of ICs related to digital circuits like 74 series, 50 series

Unit-III

Combinational Logic: Half adder, Full Adder, Half Subtractor, Full Subtractor, Binary Adder, Binary Subtractor, Encoder, Decoder, Multiplexer, Demultiplexer.

Unit-IV

Sequential Logic Circuits: Definition of Sequential circuits, Definition of Latch & Flip-Flop and their differences, RS Flip-Flop, JK Flip-Flop, D Flip-Flop, JK Master-Slave Flip-Flop with their timing diagrams and truth tables, Definition of Register, Shift Register, Buffer Register with their timing diagrams and truth tables. Definition of Counters, Synchronous, Asynchronous, Up-Down Counter, Ring Counter.

Unit-V

A/D & D/A Converter: Introduction to A to D and D to A converter, Successive Approximation method and Ladder N/W method for A/D & D/A conversion.

Programming Logic Devices: Description of programming logic devices: PAL, PLA, GALs, FPLA, PLD, CPLD, FPGA.

Memories: Introduction to memories, Primary & RAM and their types, ROM and their types, Flash memories, Secondary memories, Floppy disk, Hard disk, CD-ROM, Blue Ray Disc.

References:

1. Digital Systems by Ronald Tocci
2. Digital Electronics by Malvino-Leach
3. Digital Fundamentals by Thomas L.Floyd
4. LM on Digital Electronics by NTTF Electronics Centre, Bangalore
5. Digital Electronics by Gothman
6. Digital Electronics by Malvino-Brown

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List of Experiments

01. Study of Logic Gates- AND, OR, NOT, X-OR, X-NOR.
02. Study of Universal Gates-NAND, NOR.
03. Implementation of Basic Gates with the help of Universal gates
04. Study of BCD to Grey code Conversion.
05. Implementation of De Morgan's Theorem.
06. Study of combinational Logic. Half Adder, Full Adder, Half Subtractor, Full Subtractor, Encoder, Decoder, Multiplexer, Demultiplexer.
07. Study of Comparator.
08. Study of latch & RS flip flop.
09. Study of D flip flop, JK-flip flop, JK master slave flip flop.
10. Study of digital troubleshooting with:
    a. Logic Probe
    b. Current Tracer,
    c. Logic Pulsar
    d. Logic Chip
    e. Logic Comparator
    f. Logic Analyzer

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LINEAR INTEGRATED CIRCUITS

Unit I Introduction to Operational Amplifier: Differential amplifier, Principle, differential and commonmode of operation, concept of inverting and non- inverting input.
OpAmp: Block Diagram, IC Packages,Ideal characteristics, Electrical parameters, Input offset voltage, Input resistance, CMRR, Slew rate, Gain, Bandwidth, 741 OP- Amp characteristics, pin out and power supply requirements, Interpreting and comparison of data (as per data sheet) of 741, op07, 351, 311, TL082, LM 324.

Unit II
Linear Application: Inverting amplifier, non-inverting amplifier, Voltage follower, Adder and Subtractor , Differentiator, integrator, Scaling Amplifier, AC and DC Amplifier, Instrumentation amplifier.
Active filters: low pass, high pass and band pass, Voltage to Current converter, Current to Voltage converter

Unit III
Nonlinear applications: Comparators: functions of a comparator, modes of operation of comparator, Open loop- zero crossing detector, Schmitt trigger: Threshold levels, Inverting and non-inverting, Hysteresis curve, Converters: Voltage to Frequency Conversion, Frequency to Voltage Conversion, Sample / Hold circuit, Precision Rectifier, Oscillators: Wein Bridge Oscillator, Phase shift Oscillator, Relaxation Oscillator, Logarithmic amplifier and antilogarithmic amplifier, Basics of analog multiplier and dividers

Unit IV
Voltage Regulators: Need of Regulators, Series Regulator, Shunt Regulator, Pass Transistor Regulator, Switching Regulator, Basics of Regulator ICs like 723, LM317, 78XX , 79XX and SMPS TEA1507, TEA152X
Series Timers: Introduction, functional block diagram of a timer, Pin diagram of
555 timer, operation of timer in mono and astable modes,555 as wave generators: square wave, Saw tooth wave and Triangular Wave

Unit V
Phase Lock Loop (PLL): functional block diagram, Lock & Capture range, transfer characteristics, Basic Applications of PLL 567, PLL 565, Applications of PLL

References:

1. Operational Amplifiers and Linear Integrated Circuits by R.F. Coughlin- F.F Driscall (PHI).
2. Op-Amps and Linear Integrated Circuits by R.A. Gayakwad
3. Electronic Devices & Circuits by Robert boylestad
4. Electronic Devices & Circuits by Allen Mottershead
5. Integrated Electronic by Millman Halkias
6. Art of Electronics by Horowitz Winfield Hill
7. Operational Amplifiers and Integrated Circuits by Denton Daily
8. WBLM on Electronics circuits and design by IIT, Delhi.

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List of Experiments

1. Measurement of Different characteristics of an Op-Amp in open loop configuration.
   (a) Output Resistance
   (b) Different Input Resistance
2. Measurement of Differential characteristics of an Op-Amp in open loop configuration.
   (a) Voltage Gain
   (b) Unity Gain Bandwidth
2. Inverting Amplifier :
   (a) AC analysis
   (b) DC analysis
   (c) Unity Gain Buffer
3. Non –Inverting Amplifier:
   (a) AC analysis
   (b) DC analysis
   (c) Unity Gain Buffer
4. Op-Amp as active Filter:
   (a)Low pass filter
   (b)High pass filter
   (c)Band pass filter
5. Signal Generator using Op-Amp and Timer IC
   (a) Triangular wave generator
   (b) Schmitt Trigger
6. Signal generator using Op-Amp and Timer IC
   (a) Saw tooth wave generator
   (b) Ramp generation
7. Oscillator using Op-Amp
   (a) Wein Bridge Oscillator
   (b) R.C.Phase Shift Oscillator

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MICROPROCESSOR AND MICROCONTROLLER

Unit I

8085 Microprocessor: 8085 Architecture, Pin assignments, Block Diagram and its detailed description, Machine cycle & BUS Timing, Memory Interfacing, Address and data BUS descriptions, Interrupts and its types, 8085 Instructions Set, Addressing modes of 8085, Data Transfer operation, Arithmetic Operation, Logic operation, Branch Operation, Stack, Subroutine and related instruction.

Unit II

Assembly Language Programming: How to write, assemble and execute a simple program, 8085 Programming Model, write an assembly language program for addition, subtraction, multiplication, division and ascending & descending number series.

Unit III

Peripherals and Other Microprocessors: Peripherals: 8255 programmable peripheral interface, 8279 programmable key board interface, 8254/8253 programmable interval timer, 8259 programmable interrupt controllers, 8257 DMA controller Introduction for- Z-80, MC 6800, 8088/8086 Microprocessor.

Unit IV

Microcontroller: 8031/8051/89c51 Architecture, I/O port their structure, Addressing modes, SFRs and RAM, Use of all SFRs, Bit addressable locations, Memory organization, Internal memory, external memory, Introductions to other microcontrollers like 89c52, 89c2051 and 89c535.
Interfacing of Microcontroller with: 7-sigment display, LCD display, Key pad, A/D and D/A Converters.

Unit V

Applications of Microprocessors and Microcontrollers: Block diagram, flow diagram and their interfacing of the followings:
Temperature control and monitoring system, Speed control of DC motor, Traffic Signal control system, Elevator control system, Basics of embedded system, Data Acquisition System.

References:

1. Micrprocessor architecture programming and application with 8085/8080A by Ramesh S. Gaonkar
2. Introduction to Microprocessor by Aditya P. Mathur
3. Microprocessor & Interfacing Dougus V. Hall
4. Microprocessors & Fundamentals by B. Ram
5. 8051 Microcontroller by Kenneth Ayala
6. 8051 Microcontroller and assembly language programming by Mazidi
7. Solid state circuit design with Microcontrollers by C.K. Dwivedi (Das Publisher)

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List of Experiments

1. Study of Assembler, Complier, cross compiler, emulator, simulator.
2. Write a program in 8085 Assembly language for addition of two 8 bit numbers.
3. Write a program in 8085 Assembly language for subtraction of two 8 bit numbers.
4. Write a program in 8085 Assembly language for multiplication of two 8 bit numbers.
5. Write a program in 8085 Assembly language for division of two 8 bit numbers.
6. Write a program to perform AND, OR, Ex-OR logic operation in 8085.
7. Write a program which can move data from one memory location to another.
8. Write a program to exchange two numbers.
9. Write a program in 8051(microcontroller) assembly language programming for addition of two 8 bit numbers.

10 Write a program in 8051 assembly language programming for subtraction of two 8 bit numbers.

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ELECTRONIC MEASUREMENTS

Unit-I

Measuring System: Basic elements of measuring devices: Sensing Element suitability , Signal Conditioning Element, Output Element

Basic Parameters of Measuring devices: Accuracy, Precision, Error (Gross, Systematic & Random), Linearity, Hysteresis, Resolution, Threshold, Repeatability, Reliability or Maintainability, Span (Range), Calibration.

Standard & Units of Measurement: Primary Standard, Secondary Standard, International Standard, Voltage Standard, IEEE Standard

Basic Measuring Instrument: (Construction, working, application): PMMC Instrument, Moving iron instrument, Multimeter- Analog & Digital (Block Diagram)

Unit-II

Basics principles of Measurement:

Resistance Measurement: Low Resistance Method: Potentiometer method, Kelvin's double bridge, Medium Resistance Measurement: Wheatstone Bridge, Ammeter, Voltmeter method, substitution method. High Resistance Measurement: Loss of charge method, Meggar method.

Inductance Measurement: Approximation Method: V-I method, ammeter method, ammeter method, voltmeter method, Alternating Current Bridge Method, Maxwell's Bridge, Anderson's bridge, Hay's Bridge, Mutual Inductance Measurement : Fellies Method

Capacitance Measurement: Schering Bridge.

Unit-III

Range Extension Methods: Needs of range extension, Range Extension of Ammeter, Range Extension of Voltmeter, Need of Instrument Transformer, Advantages of Instrument Transformer, Current Transformer & Potential

Unit-IV

Cathode Ray Oscilloscope: Introduction, Construction, Block Diagram of a general Purpose C.R.O., Cathode Ray Tube (C.R.T.), Time Base Generator, Applications of C.R.O., Use of C.R.O. to Measure: Voltage, Current, Frequency, Phase Difference, Lissajou's Pattern Special Purpose C.R.O.: Dual Beam Oscilloscope, Dual Trace Oscilloscope, Digital Storage Oscilloscope

Unit-V

Transducers: Introduction and Classification of Transducers, Selecting a Transducer Sensors: diagram, bionet pattern, allic' strip, bourden tube, bellows, LVDT, variable capacitance Level measurement: Capacitance sensors, Ultrasonic transducers Pressure Measurement: Potentiometric pressure transducer, Strain gauge, piezoelectric load cell Temperature Measurement: Resistance Transducers, Thermocouple, Thermistor, Photoconductive Cells, Photo Voltaic Cell, Optical Pyrometer

References:

1. Electronic Instrumentation and measurement techniques by Cooper
2. Instrumentation Devices & Systems by Rangan
3. Electrical Measurements & Measuring instruments by Golding & Widdis
4. A course in Electrical & electronic measurement & instrumentation by A.K. sawhney

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List of Experiments

1. Self Inductance measurement by Ammeter and voltmeter method.
2. Self Inductance measurement by 3 voltmeter method.
3. Self Inductance measurement by 3 Ammeter method.
4. Self Inductance measurement by general 4 arm bridge network method.
5. Self Inductance measurement by
   (a) Maxwell Bridge method
   (b) Hays Bridge Method
   (c) Anderson Bridge Method.

- Mutual Inductance measurement by Felicis Method.
- Capacitance measurement by Wein Bridge Method.
- Capacitance measurement by Schering Bridge Method.
- Low Resistance Measurement by –
  (a) Ammeter Voltmeter Method
  (b) Potentiometer method
- Medium Resistance measurement by –
  (a) Substitution method
  (b) Wheat Stone Bridge Method.
- High Resistance Measurement by –
  (a) Ohm meter
  (b) Meggar Ammeter range extension using shunts.
- Voltmeter range extension using voltage multiplier circuit.
- Study of C.R.O.
- Measurement on CRO
  1. Voltage measurement on C.R.O.
  2. Current measurement on C.R.O.
  3. Frequency measurement on C.R.O.
  4. Phase Difference measurement on C.R.O.

MAHAKAUSHAL UNIVERSITY JABALPUR

COMMUNICATION ENGINEERING

UNIT-I:

Introduction to Communication: Meaning of communication, Verbal & Non verbal communication, Machine communication, Concept of communication system: Information transmission ,channel, reception, basic block diagram, Allocation of frequency spectrum for communication, Attenuation (in dB), bandwidth, Noise, source and types, signal to noise ratio, noise figure, Analog signal, Digital signal, Comparison between Analog and Digital communication, Advantages of digital communication systems.

UNIT-II:

Modulation Techniques: Need of modulation, Analog Modulation: Amplitude Modulation, modulation index, bandwidth and signal power, DSB, SSB and VSB, AM features and Drawbacks, Frequency Modulation: modulation index, FM spectrum and Bandwidth, FM features, comparison with AM, Graphical explanations of pulse amplitude modulation (PAM), pulse width modulation (PWM), pulse position modulation(PPM),Pulse Code Modulation (PCM): sampling, Quantization and encoding, data rate for digital voice channel.

UNIT-III:

Digital Modulation Techniques: Graphical explanations of NRZ, RZ, Manchester, binary ASK, FSK,PSK, Quadrature Modulation, Multiplexing Techniques: Need of multiplexing, frequency division multiplexing(FDM),time division multiplexing (TDM), comparison between FDM and TDM, Digital hierarchy in India.

UNIT-IV:

Fundamentals of Wire Telephone: Frequency range used for technology. Voice/Audio signal parameters: Sound pressure level, Sound intensity, loudness, loudness level, pitch & frequency, sound distortion. Electronic Telephone Instrument, Subscriber's loop, DTMF dialing, Signaling tones, Telephone Lines

Telephone Switching Techniques: Electro-mechanical switching, analog switching, digital switching techniques, Digital Time Switch, Digital Space Switch, single stage, two stage, three stage space switch, Telephone traffic calculation

UNIT-V:

Fundamentals of Electronic Exchange: An overview of manual exchange, Introduction of electronic exchange, Chronological development of electronic exchanges, Basic principles of SPC exchange, Block diagram of SPC exchange, Working of SPC exchange: Terminal equipment, switching network, switching peripheral, signaling interfaces, data processing peripheral, Telephone signaling: Telephone signals, addressing modes, call connection, subscriber's line signaling, calling subscriber's line signals, called subscriber's line signals, PBX/PABX/EPABX.

References:

1. Electronic Communication systems by Dennis Roddy & John coolen
2. Electronics communication systems by Kennedy
3. Telephony by Das & Biswas.
4. Introduction to Telephony & telegraphy by E.H. Jolly(wheeler)
5. Electronic Communication System by Willium Schwber
6. Electronic Communication System by Wayne Tomasi
7. Telecommunication switching systems and Networks by Vishwanathan

List of Experiments:

1. Study of Amplitude Modulation.
2. Study of Frequency Modulation.
3. Determine the percentage of modulation.
4. PAM, PWM, PPM Circuits for Modulation and Demodulation.
5. Study of ASK, FSK, PSK, QAM Signals.
6. Study of PCM - Pulse Code Modulation.
7. Study of FDM and TDM.
8. Study of operation of fax machine and its control.
9. Study various components of handset telephone instrument.

MAHAKAUSHAL UNIVERSITY JABALPUR

ENTREPRENEURSHIP

Unit-I

Introduction to Entrepreneurship: Definition of Entrepreneur / Entrepreneurship, Difference between Entrepreneur / Entrepreneurship, Need for Entrepreneurship, Qualities of successful entrepreneur, Myths about Entrepreneurship, Classification of entrepreneurs on the basis of different criteria, Reasons for the failure of entrepreneurs.

Unit-II

Industries and Business Organization: Concept of Industry or Enterprise, Classification of Industries, Tiny Industry, Small Scale, Medium Scale, Large Scale, Rural Industry, Cottage Industry.

Forms of Business Organization: Proprietorship, Board & Co-operative, Partnership, public Ltd, Private Ltd, IT Sector, Govt. policies for SSI promotions, Sector / Product for SSI.

Unit-III

Institutional Assistance: Infra - structural assistance, Technical Assistance, Financial assistance, Marketing, Assistance Information / guidance & Training- SISI, ASK, MPCON, CSIR, CED- MA, NRDC Infrastructure: D/C, AVN/AKVN Finance: SIDBI, KVIB, MPFC, NABARD, MPWDC,NSIC, M.P.A.V.V.N. Marketing: MP- AGRO, NSIC, PMLUN, EXPORT CORPORATION, KVIP,MPHSVN, MPLDC, Quality Control: BIS,FPO, MPLUN, F.D.A., AG. MKT.

Unit-IV

Planning of Industrial Unit: Pre- Planning Stage, Scanning the environment, Market survey, Seeking information, product / project selection, Implementation Stage:- PPR Preparation, DIC registration, Arrangement of Land, Arrangement of Power, Obtaining NOC / Licenses from various Deptt, DPR Preparation, Seeking financial assistance, Commercial Production, Post Implementation stage, Permanent registration from D.I.C., Availing Subsidies, Diversification / Modification, Setting up of marketing channel / Distribution.

Unit-V

Achievement Motivation: Historical perspective, Concept of achievement motivation, Significance of achievement motivation, Development of achievement motivation, Financial Management of an Industrial Unit (SSI): Tools of financial analysis, Ratio analysis, Fund Flow /Cash flow analysis, Working capital and Concepts, Financial accounting.

References:

1. Entrepreneurial Development Vol. I,II,III by Vasant Desai Himalaya Publication
2. CEDMAP (Center of Entrepreneurial development Madhya Pradesh)

ASSIGNMENT

1. To prepare chart to showing various factors affecting entrepreneurship.
2. To collect details related to various schemes run by the Government for Self Entrepreneurship.
3. To identify and select a project and conduct Market-Survey thereof.
4. To collect various formats used in industries & departments/institutions working entrepreneurship.
5. Visit few small scale industries situated in city, nearby industrial area.
6. Discuss the problems related to SSI (Small Scale Industries) with an era

7. Collect information about market rates quality and quantity of goods for their choice.
8. Develop logical and analytical approach to purchase the raw material / finished goods.
9. To prepare case study of successful entrepreneurs.
10 .Preparation of Project report for the industry/ Business they are willing to start.

MAHAKAUSHAL UNIVERSITY JABALPUR

MARKETING MANAGEMENT

UNIT- I

Marketing and Concept: Evolution of marketing-a historical background, The stage of barter, The stage of money economy, The stage of industrial revolution, The stage of competition, The emergence of marketing, Selected definitions of marketing, Different concept of marketing, The exchange concept, The production concept, The product concept, The sales concept, The marketing concept, Difference between selling & marketing, Benefits & significance of marketing, Helps to remove causes for under development, Improve productivity & efficiency, Canalize country's economic resources properly, Insure better deal for consumer, Make economic planning meaningful & relevant etc.

UNIT- II

Marketing Environment: Internal & external factors, Demographic environment, Economic environment, Political environment, Physical environment, Technological environment, Competitive environment, Social & cultural environment, Micro & macro environment.

UNIT- III

Marketing Planning & Organization: Scope & importance of planning, Steps in marketing, planning process: Purpose & principle of organization, Models of marketing organization, Line & staff type, Product based organization, Territory oriented organization, Complex organization, Task of chief marketing executive, Decentralization.

UNIT- IV

Market Segmentation: Types of market, Definitions & benefits of segmentation, Methods of segmentation, Geographic segmentation, Demographic segmentation, Psychographic segmentation, Buyer behavior Segmentation, Volume segmentation, Steps in market segmentation, Market targeting.

UNIT- V

Marketing research & sales forecasting: Definition & importance of marketing research, Steps in marketing research, Defining problem, Problem analysis, Developing research design, Developing research procedure, Data collection –Primary & secondary, Analyzing & interpretation, Summarizing & preparing the research report, Method of market research, Necessity & purpose of sales forecasting, Methods of sales forecasting.

References:

1. Marketing management - Analysis, Planning & Control Philip Kotler
2. Principles & practice of Marketing in India - C.B.Memoria & R.L.Joshi
3. Contemporary Marketing – Louis & Boone & David L. Kurtz
4. Essential of Management –Koontz
5. Marketing management- S.A. Sherlekar

MAHAKAUSHAL UNIVERSITY JABALPUR

INSTRUMENTATION AND CONTROL

Unit I

Electronic Instrumentation System: Block diagram, Review of primary sensing elements and Transducers.

Signal conditioning: Block diagram of DC system and AC system, Data acquisition system.

Unit II

Data transmission and Telemetry: Introduction, Method of Data Transmission, General Telemetry System, Type of Telemetry System, Brief Description of land line and R.F. telemetry system, Signal conditioning and data acquisition system.

Unit III

Displays and Recorders: Displays: Analog Indicator /Displays, Digital Display, Light Emitting Diodes, Liquid Crystal Displays.

Recorders: Graphic Recorders, Strip chart recorders, X-Y Recorders, Ultra-Violet Recorders.

Unit IV

Control System: Basic concept of open loop and closed loop control system and their comparison, Transfer function definition, Simple Mathematical problems on block diagram and signal flow graphs, Simple Mathematical model of physical systems, Analogy between different systems- Mechanical, Electrical, Thermal.

Unit V

Time Domain Analysis: First and Second order control System (Without mathematical treatment), Definition of different performance indices as delay time, rise time, peak time, percentage peak overshoot,Settling time, steady state error, Type-0, Type -1, type-2, system definition.

Concept of stability: absolute stability, relative stability, Routh and Hurwitz Criteria for stability.

Root Locus Techniques: Introduction, Root Locus concept, Construction of Root Loci.

Frequency Domain Analysis: Introduction, Nyquist Stability Criteria, Bode plots of simple control system.

Reference:

1. Modern Electronic Instrumentation and Measurement Technique by Cooper
2. Electrical Measurements & Measuring Instruments by H. W. Golding
3. Electrical and Electronic Measurements and Instrumentation by S.Ramabhadran
4. Instrumentation Devices & Systems by Rangan
5. A course in Electrical & electronic measurement & instrumentation by A.K. Sawhney.
6. Automated Process Control Systems by Ronald & Hunter

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List of Experiments:

To design practical circuits from the theoretical class room learning of

1. Photo electric system for –
(i). Measurement of speed
(ii). Liquid level measurement
(iii). Linear speed measurement
(iv). Tracking luminous object
(v). Any other application
2. Water level indication and control systems
3. Temperature control systems
4. Pressure measurement system
5. Density measurement
6. To design basic automatic system
7. To measure the resistance of LDR with the source of light at defferent distances
8. To measure the resistance of LDR with different color light.
9. To observe the effect of temperature on the resistance of thermister.
10. Visit to Industrial units where instrumentation and control system is utilized.
11. To draw the block diagram of sequential control system
12. To study a microprocessor controlled industrial control system.

MAHAKAUSHAL UNIVERSITY JABALPUR

DATA COMMUNICATION AND NETWORKS

Unit I

Introduction to Data Communication: Data Transmission mode: simplex, half duplex, full duplex Difference between Digital and Data Communication, Serial and parallel data transmission.
Character codes: Baud code, ASCII code, Error Detection techniques: VRC, LRC, CRC Error Correction techniques: symbol substitution, Retransmission, Forward Error Correction (Hamming Code).
Serial Transmission: Asynchronous and Synchronous data transmission.

Unit II

Hardware and Interface:
Data communication Hardware: basics and applications of: DCE, DTE, UART, USRT Data communication interfaces: specifications and applications of: RS 232C, USB Data MODEMS: Need of a Modem, Bandwidth, Data rate and Baud rate, Baseband and Broadband systems, Types of Modem

Unit III

Introduction to Networks: Definition of Computer Network, Applications of Computer Networks, Categories of Networks: LAN, MAN and WAN, Concept of Protocol, Open System Interconnection (OSI) Model: Layer Architecture, brief function of layers, Switching: Circuit switching, Packet switching and Message switching techniques, Introduction to Integrated Service Digital Network (ISDN) and its Applications

Unit IV

Local Area Network: advantages of LAN, Network topologies: Mesh, Star, Tree, Bus and Ring comparison, Component of Computer Networks
Understand working and application of: Server & Workstation, NIC, Hub, (Active/ Passive), Repeater, Switch, Bridge, Router, Gateway, Cabling: structure and specifications of: UTP, STP, Co-axial and Optical Fiber Access Methods: CSMA/CD and Token Passing Types of LAN: Ethernet, Token Ring and FDDI comparison, Knowledge of LAN Software: WINNT, WIN2000, LINUX

Unit V

Inter Networking: Structure of Internet, Goals of Internet, TCP/IP Protocol suite, Comparison between OSI and TCP/IP, IP addressing concept, address classification- class A, class B, class C addresses, Domain Name System (DNS) and Uniform Resource Locator(URL) Internet services: E-mail, FTP and Telnet.

Reference Books

1. Computer Networks by Tenenbaum
2. Introduction to Digital & Data communication by Michael A. Miller
3. IBM PC and Clones by Govindrajalu

List of Experiments

1. Their connectors
2. Study of RS 232C interface
3. Study of different type of Modem
4. Study of Network Operating Systems available in the Lab Installation and Configure Server and Workstation software
5. Study of Various Interconnecting devices like NIC, Hub, Switch etc.
6. Study of Internet for data transfer and its various applications.

MAHAKAUSHAL UNIVERSITY JABALPUR

INDUSTRIAL ELECTRONICS

Unit-I

Review of the characteristics of power electronic devices: power diode, SCR, TRIAC, DIAC, UJT & Power Transistors: Static & Dynamic Characteristics, Turn on & Turn off methods (communication),Selection & technical Specification (data-Sheet), Protection against over voltage & over current.

Unit-II

Single phase and three phase rectifier Diode & SCR: Uncontrolled with R load under continuous current mode function, Controlled with R load under continuous current mode function, Input & output wave form, Quantitative description and comparison of technical parameters such as V_{dc},V_{rms}, efficiency, RF etc, Merits & Demerits.

Unit-III

Triggering Circuits: Principle features of firing circuits, UJT pulse triggering circuits, Phase Shift Triggering.

Inverter and Chopper: Principle, Types and classification, Transistorized inverter and chopper, 3 Phase operation of inverter, Practical Applications of each.

Unit-IV

Simple speed control methods of DC and AC motors: Speed torque characteristics of DC & AC motor, Methods of Speed control (AC&DC), Basic Elements /Components of Speed Control (AC&DC), Open loop & closed loop methods (AC&DC), Block Diagram, Armature & Field Control, Block Diagram(DC), Frequency & Slip Control block Diagram (AC description), Choice between AC & DC Drive.

Unit-V

Miscellaneous applications of power electronics: Introduction, Principle & working, Different types, Block Diagram, Practical Applications of the: UPS, Resistance Welding, RF Heating, Diathermy, Ultra Sonic, Electronic Ignition

References:

1. Electrical Machinery by P.S. Bimbhra
2. Power Electronics by P.C.Sen
3. Thyristor Engineering by M.S.Berde
4. Thyristorized Power Controller by Sugandhi & Sugandhi
5. Industrial Electronics by G.K.Mithal

MAHAKAUSHAL UNIVERSITY JABALPUR

ANTENNA AND MICROWAVE ENGINEERING

UNIT-I

Wave Propagation: Ranges of Electromagnetic waves for Communication, frequency-wavelength relation, attenuation of EM waves in air, review of Reflection, refraction, interference, diffraction and Polarization of EM waves, Ground wave propagation, Space wave propagation: radio horizon, fading.

Sky wave propagation: Ionosphere layers, day and night effect, reflection & refraction of radio waves in ionosphere, critical frequency and Maximum usable frequency, Optimum working frequency, Skip distance and single hop/multi hop transmission. Frequency ranges, advantages & disadvantages.

UNIT-II

Transmission lines & their characteristics: Parallel wire and co -axial cables, Primary and secondary constants of transmission line, equivalent circuit, Propagation constant, attenuation constants, Transmission line losses, Characteristics impedance of parallel wire and co-axial cable, Incident wave, reflected wave and standing wave, Standing wave ratio (SWR) and Reflection co-efficient, Open circuit and short circuit lines, Voltage and current distribution.

Impedance matching: Need, quarter wave transformer matching, stub matching

UNIT-III

Waveguides and components: Waveguides concept, Comparison with transmission lines, Rectangular and circular waveguide comparison, Cutoff wavelength and frequency in Rectangular waveguide, Dominant TE_{10} Mode: field pattern & its excitation in rectangular waveguide, Waveguide passive components: List and their uses.

UNIT-IV:

Microwave Solid State devices: Limitations of transistors at microwave frequency, microwave transistors, Concept of negative resistance devices, parametric amplifier (PARAMP) and frequency converters, Gunn effect and Gunn diode oscillators

Microwave Tubes: Limitation of conventional tubes, Klystron amplifier, Reflex Klystron, Traveling Wave Tube (TWT), Magnetron

UNIT-V:

Antenna Fundamental & their characteristics: Introduction: antenna as a radiator, Reciprocity, Radiation resistance, Efficiency, Radiated field strength at a point, Isotropic radiator, Gain & Directivity, Radiation pattern and Beam width, Bandwidth of an antenna, Antenna Polarization, Effective height and effective aperture.

Type of Antenna and their uses: Dipole antenna, half wave antenna and folded dipole, distribution of voltage & current for half wave dipole. Antenna arrays: need of array, Physical Structure and applications of the following Antennas: Marconi antenna, Yagi-Uda Antenna, Parabolic reflector antenna, Horn antenna

Reference Books

3. Microwaves by Gupta K.C.
4. Antennas by Kraus

5. Electronic Communication System by Tomasi

List of Experiments:

1. Demonstration of microwave component
2. Study of VSWR meter.
3. Measurement of frequency of microwaves
4. Measurement of standing wave ratio (VSWR) and reflection coefficient.
5. Measurement of cutoff wavelength (TE 10 mode) Using $c=2/(m/a) + (n/b) = 2a$
6. Measurement of guided power in waveguide and Transmission lines.
7. Measurement of attenuation in dB for a given component.
8. Measurement of characteristics of klystron tube. Measurement of V-I characteristics of Gunn Diode. Performance of Gunn Oscillator.
9. Measurement of attenuation in Db for a given component.
10. Measurement of radiation pattern for different antenna.
11. Power Measurement in Transmission lines and Waveguide

MAHAKAUSHAL UNIVERSITY JABALPUR

ELECTRONIC WORKSHOP PRACTICE

Unit-I

Electrical & Electronics Maintenance: Awareness of cleaning of dust & corrosion, Oiling & greasing for lubricating of moving parts of tools and equipment, Protection of tools & equipment from dust and temperature

Unit-II

Review of Tools and Electrical Accessories: Identification and selection of tools like Pliers, screw drivers, Poker, Hammer, Hacksaw, Firmer, Hand drill, Phase tester, Study of different types of wires and their specifications, Study of Switches, resistors, capacitors and transformers

Unit-III

Electronic Work Shop: Material required in electronic work shop like tag points, terminal soldering, metal flux etc, Identification & testing of electronic components including ICs and SMDs

Soldering: selection of soldering iron, Soldering metal flux, soldering technique, desoldering technique, AC & Dc voltage & current measurement with multimeter, continuity test, measurement of resistance

Unit-IV

P.W.B. Fabrication: Specify the need of PWB in electronic circuits. Merits and Demerits of PWB,Describe the methods of PWB making: photo printing and screen printing. Describe features of different types of copper clad and laminates. State properties and applications of various types of PWB's like single layer, double layer and multiplayer. PWB Fabrication for SMD components PWB Designing using software like Circuit Maker etc

Unit-V

Designing and Fabrication of Small Electronic Project: Use data book to get the relevant information of components. Check digital and Linear IC's on bread board with the help of data book, Make Art work for a small project, Prepare the PWB for the project, Check and test the PCB Fabricate cabinet, Prepare project report, Demonstrate the function / working of the prepared project

References:

The Design and drafting of Printed CircuitsBy – Mr. Darryl Lindsey

List of Experiments:

1. To Study of UV Exposure
2. To Study of Dip Coating Machine
3. To Study of Curing Oven
4. To Study of Electronic Tool Kit
5. To Study of Mechanical Tool Kit
6. To Study of Crimping Tools
7. To Study of Clamping/ Tong Tester
8. To Study of Etching Machine
9. To Study of Temperature Controlled Soldering Iron unit
10. To Study of Shearing Machine

MAHAKAUSHAL UNIVERSITY JABALPUR

CONSUMER ELECTRONICS

UNIT- I

Audio Technology: Principle & working of microphone, types of microphone and their application- Carbon granule microphone, Condenser, Ribbon, crystal,
Principle & working of speakers, types of speakers: PMMC, Frequency response of speaker, Audio amplifier, application of audio amplifiers: PA system

UNIT- II

Broad Casting Receiver: AM Receiver: Explain- TRF, super heterodyne, Double heterodyne FM Receiver, Ratio Detector, Foster sealed phase discriminator, FM Channels, Qualities of receivers

UNIT- III

TV Technology: Principles of Television: TV standards, Scanning, Video Bandwidth, Modulation techniques, Channel allocation, Composite Video signal
TV Camera: Principle & working of Videocon TV Camera.
TV Receiver: block diagram and working of B&W receiver and PAL Receiver
Display Technologies: CRT Monitor, LCD Monitor, PLASMA monitor

UNIT- IV

Media Players: Block Diagram of Players: Audio CD Players, Video CD Players, DVD Players Introduction to Blue Ray disc player, HD DVD
Multimedia: Introduction to multimedia, Different audio and video formats related to multimedia, MPEG1,MPEG2, MPEG3, MPEG4, Multimedia editing tools- Movie Maker, Nero wave Editor. Application of multimedia in education, entertainment, advertisement, research.
PRJECTORS : DLP Projector, LCD Projector

UNIT- V

Security & Safety System: Burglar's alarm, Video door phone, CCTV, Electronic combination locks, Fire alarm

Reference Books:

1. Monochrome & Color TV- R.R. Gulati
2. Television – Dhake
3. Audio & Video Techniques- R.G.Gupta
4. Electronic Communication- Roody & Coolen
5. Electronic Communication System – Kennedy
6. Audio & Video Techniques- Ajay Sharma

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List of Experiments

1. Study of different microphones & speakers
2. Plotting of directional property of microphones & speakers
3. Frequency response character of microphones &
4. speakers
5. Study of audio amplifiers stages (pre amplifier, voltage amplifier,power amplifier)
6. Study of AM receiver characteristics i.e sensitivity, selectivity, fidelity, SNR, stability
7. Study of FM receiver characteristics i.e sensitivity, selectivity, fidelity, SNR, stability
8. Demonstrate B/W TV receiver
9. Demonstrate Color TV receiver
10. Study of composite video signal using pattern generator
11. Market survey of different types of monitors & their comparison
12. Assembly & disassembly of CD player mechanism Market survey & comparison of different types of monitors i.e LCD, CRT, LED monitors
13. production of multimedia CD using general multimedia software i.e Movie maker
14. Study of multimedia format
15. study of security and safety systems

MAHAKAUSHAL UNIVERSITY JABALPUR

ADVANCED COMMUNICATION

UNIT- I

Optical fiber communication: Light propagation through optical fiber; basic fiber structure, total internal reflection, Numerical Aperture, Acceptance angle, Attenuation in optical fiber. Dispersion: basics of Modal dispersion, Material and waveguide dispersion, relation between data rate and dispersion

Types of fibers: Single mode fiber, Multimode fiber, Graded index fiber; comparison Structure of Fiber optic cables, Optical Communication system: block diagram, Light source: LED and Laser Diode, Detectors: PIN,photodiode and Avalanche photodiode, Specification criteria in selection of transmitter & receiver

Tool for Installation and maintenance: Application of: Optical power meter, OTDR, Fusion Splicing Machine.

UNIT- II

Cellular Communication: The Cellular Concept, Frequency bands and cellular coverage, Geometry of a cell: Cell size and Number of possible users, Frequency reuse and hand-off.

Cellular system implementation: Cell office, MTSO, Block diagram of cellular hand set, Introduction to handset operating systems, Access technology- FDMA, TDMA & CDMA, comparison, GSM Services, speech group call and related services, general packet radio service (GPRS), short message services,(SMS), CDMA based digital cellular system, spread spectrum modulation, frequency hopping, Features of Third generation cellular service

UNIT- III

Satellite Communication: advantages and disadvantages of Satellite system, Frequency bands, Uplink and Downlink frequencies, Satellite basics- Orbits, Altitude, footprint, Low orbit regional satellites, Geostationary satellite, Satellite system link model- uplink, transponder, downlink, cross link, Block diagram of Satellite, Earth station, Block diagram of Satellite and communication transponder, Satellite multiple access- FDMA,TDMA & CDMA, TV channel reception via Satellite, Global Positioning System (GPS) and GPS, Navigation basics, Direct to home (DTH) basics.

UNIT- IV

RADAR: Basic RADAR system and applications, Frequencies and Powers used in RADAR, Definition of Range, pulse width, PRF, duty cycle, RADAR Range equation and factors that affect Range, Scanning methods, Search and Track RADAR system, Display method: PPI, Basic pulsed RADAR system, MTI and CW Doppler RADAR.

UNIT- V

Emerging Trends in Technology:

Bluetooth Technology: Introduction, Standards Services, applications, Introduction to IP TV, iPhone, Introduction to WAP, EDGE, HSPDA, OTA, VOIP

Reference Books:

1. TV & VIDEO- R. G. GUPTA
2. Basic television system- R.R. Gulati

List of Experiments:

1. Measurement of attenuation in optical fiber
   (a) Measurement of Propagation loss
   (b) Measurement of bending loss
2. Measurement of numerical aperture
3. Measurement of characteristics of fibre optic LED and photo detector.
4. Measurement of Radiation Pattern of LED
5. Forming simple fiber optic analog link.
6. Study of PC- to- PC communication using optical fiber link and two RS 232 cards.
7. Setting up CW Doppler RADAR and measure speed of a moving object
8. Experiments based on Mobile communication.
9. Experiments based on GPS system.
10. Experiments based Satellite communication.
11. Experiments based on Bluetooth devices

MAHAKAUSHAL UNIVERSITY JABALPUR

COMPUTER PROGRAMMING

UNIT- I

Introduction: program concept, Assembler, Compiler & Interpreter, characteristics of a good program, various stages in program development, Algorithms, Flowcharts, pseudo- codes, programming technique- top down, bottom-up, structured programming.

UNIT- II

Fundamentals of C: History & Features of C, C program structure, pre-processor directives, C tokens character set, keywords, identifiers, constants, variables, data types, data types conversion, Expressions, Statements, Use of header files, Defining macros, input/output functions- printf(), scanf(), getchar(), putchar(),gets(), puts() etc. Formatted I/O using control string.

UNIT- III

Operators in C: Arithmetic Operators, Logical Operators, assignment operator, Relational Operators, Bitwise Operators, Special Operators: exp, exit(), sizeof(), increment and decrement (post and pre). operators-precedence & associatively, Type casting, C expression data type, order of evaluation of expression.

UNIT- IV

Control Statements: Loop statements: for statement, while statement, Do-while statement, break-continue statement, nested loop.
Branching statements: if statement, if- else, nested if, Unconditional branching: go to statement Multiple branching statements: switch case statement.

UNIT- V

FUNCTIONS: Basics of function, types of C Functions, Bindings of function, parameters of functions, local and global variables.
User-defined Functions - Function declaration, Function prototype, scope and life of variable-actual, formal, call by value, call by reference.
Implementations, Accessing a Function, Arguments and Parameter passing mechanisms, recursion, Storage classes – static auto, extern, and register, built-in function: declaration, Accessing, Parameter passing.

Reference Books:

1. Theory and problems of programming with 'C', Gottfried., Schaum's series
2. Chapman, Understanding windows, BPB Publication
3. C: the complete reference, Herbert schildt,4 edition, McGraw-Hill Osborne Media
4. Complete reference of C++,

List of Experiments:

1. Working with turbo C editor
2. Program using printf() scanf() and formatted I/O, string manipulations. Defining and using Macros
3. Program using Operators
4. Program using various Control Statements
5. Program using Single dimensional and Two-dimensional array, Program using Functions
6. Program using call by Value & Call by reference Program using Static, Auto, & Extern function, Program using Structure &Union
7. Program using Pointers & Files.
8. Program to print hello using classes in c++ ,Program to print hello in java
9. Program to learn, to write assembly language in C
10. One Small Project must be developed in C & C++ language.

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PROJECT

Project work is the area in which a student can show his creativity resources fullness, knowledge and various skills attained through the labs and work-shop during the course duration.
Project work leads the student to develop his original thinking, group discussion, leadership, interpersonal relations, inter disciplinary relation and polishes his behavior in the society.
He is also exposed to market survey for procurement of components, suiting to the circuit, their equivalents, the process of try outs of circuits, modification of circuit values and finally getting the desired result.
An electronics diploma student has very vast scope of preparing project, as electronics has entered in every walk of life of the society and every hour of one's daily life.
The support of the institution, faculty members, and supporting staff is of paramount importance and their quality is also reflected in the quality of the final shape of the project.
A good project work earns credit for all concerned and increase scope of employment / self employment when presented to potential employer. With this view curriculum can not be bound in any limits and boundary on papers. Reasonable freedom has to be given for selecting the project work as far as the project is feasible and economically viable and socially useful.
The objective of the course 'Project' is

_ To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
_ To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
_ To students an opportunity to do something creative and to assimilate real life work situation in institution.
_ To adapt students for latest developments and to handle independently new situations.
_ To develop good experiences, power and presentation abilities in students.

Students already have a glimpse of project work as they have worked on Minor Project Work in V semester. This gives the students an occasion to observe the work on real life projects and select some application area in which he/she will be undertaking project. External guide from industry can also be selected for project work along with an internal guide to prepare innovative and real projects. Students also have the flexibility of extending the minor project work into Major project, if the area has a scope for that.
The purpose of providing six hours per week is to orient the student's in-groups on the following objectives:

_ Provide general guidelines regarding execution of work.
_ Impart instructions regarding write-up work and preparation of project documents.
_ Sharing and solving common problems associated with execution of project work.
_ Monitor and evaluate the progress of project work.

The faculty and student should work according to following schedule:

1. Each student undertakes substantial and individual project in an approved area of the subject and supervised by member of staff.
2. The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.
3. The project development must be carried out according to following steps and final write-up should have the same sequence.

_ Project objectives.
_ Requirement gathering.
_ Modeling of project should be done in any well- known modeling tools.
_ Analysis of Project.
Design of Project.

_ Implementation of project.
_ Testing on project.
_ Quality consideration of project.
_ Designing a small user manual.
_ Estimating the cost of the project.
_ Future scope and suggestions.

ACTION PLAN FOR PROJECT WORK AND EVALUATION SCHEME (SUGGESTIVE):

- Orientation of students by HOD/Project supervisor.
- Literature survey and resource collection.
- Selection and finalization of topic before a committee.
- Detailing and preparation of project (Modeling, Analysis and Design of Project work)
- Development Stage.
- Testing, improvements, quality control of project.
- Acceptance testing.
- Report writing.
- Presentation before a committee (including user manual)

Committee comprises of HOD, all project supervisors including external guide from industry the above marking scheme is suggestive, it can be changed to alternative scheme depending on the type of project, but the alternative scheme should be prepared in advance while finalizing the topic of project before a committee and explained to the concerned student as well.

REFERENCES / SOURCES FOR GUIDANCE TO STUDENT FOR SELECTION OF PROJECT WORK:

1. Electronics Magazines & Journals.
2. District Industries Center.
3. Industry-Institution Interaction
4. Small Scale industry
5. Industrial problems discussed during industry visit/training.
6. Entrepreneurship development Board Magazine.
7. "Prime Minister Rojgar Yojana" projects from district Collectorate.