Faculty of Engineering & Technology

P.K.University

Shivpuri (MP)

Evaluation Scheme & Syllabus for

Department of Electronic & Communication Engineering

Diploma Syllabus (I-VI Sem)

(Effective from session 2019-20)

EVALUATION SCHEME

SEMESTER I

		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DECE-101	Foundation Communication	30	70		25	150
DECE-102	Applied Mathematics-I	30	70	NA	NA	100
DECE-103	Applied Physics	30	70	25	25	150
DECE-104	Applied Chemistry	30	70	25	25	150
DECE-105	Electronic Components And Devices	30	70	25	25	150
DECE-106	Technical Drawing	30	70	NA	NA	100

SEMESTER II

		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DECE-201	Applied Mathematics-II	30	70	NA	NA	100
DECE-202	Applied Physics-II	30	70	25	25	150
DECE-203	Engineering Mechanics & Material	30	70	NA	NA	100
DECE-204	Electrical Engineering-I	30	70	25	25	150
DECE-205	Introduction To Computer (Practical)	NA	NA	25	25	50
DECE-206	Elementary Workshop Practice (Practical)	NA	NA	25	25	50

SEMESTER III

		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DECE-301	FunctionalCommunicaton	30	70	25	25	150
DECE-302	Applied Mathematics-III	30	70	NA	NA	100
DECE-303	Electrical Engineering-II	30	70	25	25	150
DECE-304	Electronic Devices And Circuits	30	70	25	25	150

SEMESTER IV

		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DECE-401	Programming In C & C++	30	70	25	25	150
DECE-402	Networks, Filters & Transmission Lines	30	70	25	25	150
DECE-403	Principles of Communication Engg.	30	70	25	25	150
DECE-404	Principles of Digital Electronics	30	70	25	25	150

SEMESTER V

		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DECE-501	Industrial Management & Entreprenurship Dev.	30	70	NA	NA	100
DECE-502	E.I.M.	30	70	25	25	150
DECE-503	Audio And Video Engg.	30	70	25	25	150
DECE-504	Optical Fibre Engg.	30	70	25	25	150
DECE-505	Integra. Comm. (PRACTICAL)					

SEMESTER VI

		THEORY		PRACTICAL		TOTAL
SUBJECT CODE	SUBJECT NAME	SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
DECE-601	Environmental Education & Disaster Mgmt.	30	70	NA	NA	100
DECE-602	Microprocessor And Application	30	70	25	25	150
DECE-603	Modern Communication System	30	70	25	25	150
DECE-604	Microwave & Radar Engg.	30	70	NA	NA	100
DECE-605	Project	NA	NA	25	25	50

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
SEMESTER I
DEC-101 FOUNDATIONAL COMMUNICATION
SECTION "A" (ENGLISH)

1. PARTS OF SPEECH :

a. Noun
b. The pronoun : Kinds and Usage
c. The adjective : Kinds and Degree
d. Determiner : Articles
e. The verb : Kinds
f. The Adverb : Kinds, Degree and Usage
g. Prepositions
h. Conjunctions
i. The Interjections
j. Subject: Verb Agreement (Concord)

2. **VOCABULARY BUILDING :**

a. Antonyms and Synonyms
b. Homophones
c. One word substitutions
d. Idioms and Phrases
e. Abbreviations

3. **Grammar**

a. Sentence & its types
a. Tenses
b. Punctuations
c. Active and Passive voice
d. Transformation of Sentences
e Synthesis of Sentences
f. Direct and Indirect Narrations

4. **DEVELOPMENT OF EXPRESSION (Composition) :**

a. Paragraph Writing
b. Essay Writing
c. Proposal Writing
d. Letter Writing (Formal, Informal, Business, official etc.)
f. Report Writing
g. Note Making
h. News Making
i. Application Writing
j. Minute Writing
k. Invitation Letter Writing

SECTION "B" (Hindi)

5– संज्ञा, सर्वनाम, विषेशण, क्रियाविषेाण, वर्णसमास, संधि, अलंकार, रस, उपसर्गप्रत्यय।

6– पत्र लेखन, निविदासंविदा, दरआमंत्रण (कोटेषन)अपील, स्वतन्त्र अभिव्यक्ति, प्रतिवेदनलेखन, प्रेसविज्ञप्ति।

7–वाक्य/वाक्यांष के लिए **श**ब्द, पर्यायवाची या समानार्थी **श**ब्द, विलोम **श**ब्द, अनेकार्थी **श**ब्द, **श**ब्दयुग्म या समुच्चारित **श**ब्दसमूह, वाक्य **शु**द्ध (**शु**द्ध **अशु**द्ध वाक्य), मुहावरे एवं लोकोक्तियॉ।

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year I Semester

DEC-102 APPLIED MATHEMATICS I

1. ALGEBRA-I :

1.1 Series : AP and GP; Sum, nth term, Mean

1.2 Binomial theorem for positive, negative and fractional index (without proof). Application of Binomial theorem.

1.3 Determinants : Elementary properties of determinant of order 2 and 3, Multiplication system of algebraic equation, Consistency of equation, Crammer's rule

2. ALGEBRA-II:

2.1 Vector algebra : Dot and Cross product, Scaler and vector triple product.

2.2 Complex number : Complex numbers, Representation, Modulus and amplitud Demoivre theorem, its application in solving algebraic equations, Mod. function and its properties..

3. TRIGONOMETRY :

3.1 Relation between sides and angles of a triangle : Statement of various formulae showing relationship between sides and angle of a triangle.

3.2 Inverse circular functions : Simple case only

4. DIFFERENTIAL CALCULUS - I :

4.1 Functions, limits, continuity, - functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.

4.2 Methods of finding derivative, - Function of a function, Logaritimic differentiation, Differentiation of implicit functions.

5. DIFFERENTIAL CALCULUS -II :

5.1 Higher order derivatives, Leibnitz theorem.

5.2 Special functions (Exponential, Logarithmic, Inverse circular and function), Definition, Graphs, range and Domain and Derivations of each of these functions.
5.3 Application - Finding Tangants, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, velocity, Acceleration, Errors and approximation.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year I Semester

DEC-103 APPLIED PHYSICS-I

1. UNITS AND DIMENSIONS (4 MARKS)

S.I. Units & Dimensions of physical quantities, Dimensional formula and dimensional equation. Principle of homogeneity of dimensions and applications of homogeneity principle to: (i) Checking the correctness of physical equations, (ii) Deriving relations among various physical quantities, (iii) Conversion of numerical values of physical quantities From one system of units into another. Limitations of dimensional analysis.

2. ERRORS AND MEASUREMENT (4 Marks)

Errors in measurements, accuracy and precision, random and systematic errors, estimation of probable errors in the results of measurement(Combination of errors in addition, subtraction, multiplication and powers). Significant figures, and order of accuracy in respect to instruments,

3. CIRCULAR MOTION (5 MARKS)

Central forces. Uniform Circular motion (Horizontal and Vertical cases),angular velocity, angular acceleration and centripetal acceleration. Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge.

4. MOTION OF PLANETS AND SATELLITES :(5 Marks)

Gravitational force, Acceleration due to gravity and its variation w..r. to height and depth from earth, Kapler's Law, Escope and orbital velocity, Time period of satellite, Geo- stationary, Polar satellites.

DYNAMICS OF RIGID BODY (ROTATIONAL MOTION) (6 MARKS)

Rigid body, Rotational motion, Moment of inertia, Theorems(Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies (Lamina, Sphere, Disc, Cylindercal),Concept of Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling of sphere on the slant plane . Concept of Fly wheel.

6. FLUID MECHANICS :(5 MARKS)

Surface tension, Capillary action and determination of surface tension from capilary rise method, Equation of continuity (A1V1=A2V2), Bernoulli's theorem, and its application stream line and Turbulent flow, Reynold's number.

7. FRICTION :(4 MARKS)

Introduction, Physical significance of friction, Advantage and disadvantage of friction and its role in every day life. Coefficients of static and dynamic friction and their measurements. viscosity, coeff. of viscosity, & its determination by stoke's method.

8. HARMONIC MOTION (6 MARKS)

Periodic Motion , characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of its periodic time. Energy conservation in S.H.M.. Concept of phase, phase difference, Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

9. HEAT & THERMODYNAMICS: (6 MARKS)

Modes of heat transfer (Conduction, Convection and Radiation), coefficient of thermal conductivity Isothermal and adiabatic process. Zeroth First, Second Law of Thermodynamics and Carnot cycle, Heat Engine (Concept Only).

10. ACOUSTICS (5 MARKS)

Definition of pitch, loudness, quality and intensity ofsound waves. Echo, reverberation and reverberation time. Sabine's formula without Derivation. Control of reverberation time (problems on reverberation time). Accoustics of building defects and remedy.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year I Semester

DEC-104 APPLIED CHEMISTRY

1. **ATOMIC STRUCTURE :**

Basic concept of atomic structure, Matter wave concept, Quantum number, Haisenberg's Uncertainty Principle, Shaples of orbitals.

2. **CHEMICAL BONDING :**

Covalent bond, Ionic & Co-ordinate, Hydrogen bonding, Valence bond theory, Hybridisation, VSEPR theory, Molecular orbital theory.

3. **CLASSIFICATION OF ELEMENTS :**

Modern classification of elements (s,p,d and f blcok elements), Periodic properties : Ionisation potential electro negativity, Electron affinity.

4. **ELECTRO CHEMISTRY-I:**

Arrhenius Theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of Acid and bases : Bronsted, Arrhenius and Lewis theory. Concept of pH and numericals. Buffer solutions, Indicators, Solubility product, Common ion effect with their application,

5. **ELECTRO CHEMISTRY-II:**

Redox reactions, Electrode potential(Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electro chemical series and its application. Chemical and Electrochemical theory of corrosion, Galvenic Series. Prevention of corrosion by various method.

6. **CHEMICAL KINETICS :**

Law of mass action, order and molecularity of rection. Activation energy, rate constants, Ist order reactions and 2nd order reactions.

7. **CATALYSIS :**

Definition Characteristics of catalytic reactions, Catalytic promotors and poison , Autocatalysis and Negative catalysis, Theory of catalysis, Application.

8. **SOLID STATE :**

Types of solids (Amorphous and Crystalline), Classification (Molecular, Ionic, Covalent, Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of Crystals, FCC, BCC, Crystal imperfection.

9. **FUELS :**

Definition, its classification, high & low Calorific value.Determination of calorific value of solid and liquid fuels by Bomb calorimeter.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Disel and Petrol), Benzol and Power alchol. Knocking, Anti-knocking agents, Octane number and Cetane number.

Cracking and its type, Gasoling from hydrogenation of coal (Bergius process and Fischer tropsch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG and CNG.

Numerical Problems based on topics

10. **WATER TREATMENT :**

Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolote and Ion exchange resin process). Disadvantage of hard water in different industries, scale and sludge formation, Corrosion, Caustic embritlement, primming and foarming in biolers.

Disinfecting of Water By Chloramine-T, Ozone and Chlorine. Advantage and disadvantage of chlorinational, Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Numerical Problems based on topics.

11. **COLLOIDAL STATE OF MATTER :**

Concept of collidal and its types, Different system of colloids, Dispersed phase and dispersion medium. Methods of preparation of colloidal solutions, Dialysis and electrodialysis. Properties of colloidal solution with special reference to absorption, Brownian Movement, tyndal effect, Electro phoresis and coagulation. relative stability of hydrophillic and hydrophobie colloids. Protection and protective colloids. Emulsion, Types, preparation, properties and uses. Application of colloids chemistry in different industries.

12. **LUBRICANTS :**

Definition, classification, Necessasity and various kinds of lubricants. Function and mechanism of action of lubricants and examples. Properties of lubricants, Importance of additive compunds in lubricants, Synthetic lubricants and cutting fluids. Industrial application, its function in bearing.

13. **HYDROCARBONS:**

A. Classification and IUPAC nomeuclature of organic compounds hamologous series (Functional Group)

B. Preparation, properties and uses of Ethane, Ethene, Ethyne (Acetylene), Benzene and Toluene.

14. **ORGANIC REACTIONS & MECHANISM:**

1. Fundamental auspects -

A. Electrophiles and nucleophiles, Reaction Intermediates, Free radical, Carbocation, Carbanion

B. Inductive effect, Mesomeric effect, Electromeric effect.

2 .A. Mechanism of addition reaction (Markonicove's Rule, Cyanohydrin and Peroxide effect),

B. Mechanism of Substitution reactions; (Nucleophillic) hydrolysis of alkyle halide, electrophillic substitution halogenation, Sulphonation, Niration and friedel-Craft reaction.

C. Mechanism of Elimination reaction - Dehydration of primary alcohol, Dehyrohalogenation of primary alkyl halide.

15. **POLYMERS :**

1. Polymers and their classification. Average degree of polymerisation, Average molecular weight, Free radical polymerisation (Mechanisms)
2. Thermosetting and Thermoplastic resen -

A. Addition polymers and their industrial application- Polystyrene, PVA, PVC, PAN, PMMA, Buna-S, Buna-N, Teflon.

B. Condensation polymer and their industrial application : Nylon 6, Nylon 6,6, Bakelite, Melamine formaldehyde, Urea formaldehyde, Terylene or Decron, Polyurethanes.

3. General concept of Bio polymers, Biodegradable polymers and inorganic polymers(Silicon)

16. **SYNETHETIC MATERIALS :**

A. Introduction - Fats and Oils
B. Saponification of fats and oils , Manufacturing of soap.
C. Synthetic detergents, types of detergents and its manufacturing.
3. EXPLOSIVES: TNT, RDX, Dynamite.
4. Paint and Varnish

DEC-104 APPLIED CHEMISTRY

LIST OF PRACTICALS

1. To analyse inorganic mixture for two acid and basic radicals from following radicals

A. Basic Radicals :

NH4+, Pb++, Cu++, Bi+++, Cd++, As+++, Sb+++, Sn++, Al+++, Fe+++, Cr+++, Mn++, Zn++, Co++ Ni++, Ba++, Sr++, Ca++, Mg++

B. Acid Radicals :

CO3--, S--, SO3--, CH3,COO-, NO2-, No3- , Cl-, Br_ , I- , So4--

2. To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.

3. To determine the total hardness of water sample in terms of CaCo3 by EDTA titration method using Eriochroma black-T indicator.

4. To determine the strength of given HCl solution by titration against NaOH solution using Phenolphthalium as indicator.

5. To determine the Chloride content in supplied water sample by using Mohr's methods.

6. Determination of temporary hard ness of water sample by O- Hener's method.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year I Semester
DEC-105 ELECTRONIC COMPONENTS & DEVICES

1. INTRODUCTION TO ELECTRONICS:

1.1. Application of Electronics in different fields.
1.2. Brief introduction to active components and devices.

2. PASSIVE COMPONENTS:

2.1. Resister- Working characteristics/properties, Resistors-Carbon film, metal-film, carbon composition, wire wound and variable type (presets and potentiometers) constructional details, characteristics (size, voltage, tolerance temperature and frequency dependance and noise consideration, specification Testing, mutual comparison and typical applications, Voltage Dependent Resistor (VDR).
2.2. Capacitors- Working characteristics/properties, Capacitors-polyster, Metallized polyster, ceramic paper mica and electrolytic tantalum and solid aluminium types; construction details and testing, specifications, mutual comparison & typical applications.
2.3. Inductors, Transformers and RF coils- Working characteristics/properties Methods of manufacture of inductors, RF coils and small power and AF transformer and their testing. Properties of cores. Needs and type of shielding.

3. VOLTAGE AND CURRENT SOURCES:

3.1. Concept of constant voltage sources, symbol and graphical representation, characteristics of ideal and practical voltage sources.
3.2. Concept of constant current source, symbol and graphical representation, characteristics of ideal and practical current sources.
3.3. Conversion of voltage source into a current source and vice-versa
3.4 Concept of floating and grounded D.C. supplies.

4. SEMICONDUCTOR DIODE:

4.1. P-N junction diode, Mechanism of current flow in P-N junction drift and diffusion currents, depletion layer, potential barrier, P-N junction diode characteristics, zener & avalanche breakdown, concept of junction capacitance in forward & reverse bias conditions.
4.2. Semiconductor diode characteristics, dynamic resistance & their calculation from diode characteristics, dynamic resistance of diode in terms of diode current. Variation of leakage current and forward voltage with temperature(No deveration).
4.3. Diode (P-N junction) as rectifier, Half wave rectifier fullwave rectifier including bridge rectifier, relationshi between D.C. output voltage and A.C. input voltage rectification efficiency and ripple factor for rectifier circuits, filter circuits shunt capacitor, series inductor, capacitor input filter, bleeder resistance, working of the filters and typical applications of each type.
4.4. Different types of diodes, characteristics and typical application of power diodes, zener diodes, varactor diodes, point contact diodes, tunnel diodes, LED's and photo diodes.
4.5. Important specifications of rectifier diode and zener diode.

5. INTRODUCTION TO BIPOLAR TRANSISTOR:

5.1. Concept to bipolar transistor as a two junction three terminal device having two kinds of charge carriers, PNP and NPN transistors, their symbols and mechanisms of current flow, explanation of fundamental current relations.Concept of leakage current (ICBO) effect of temperature on leakage current.Standard notation for current and voltage polarity.

5.2. CB, CE and CC configruations.

(a) Common base configuration (CB): inputs and output characteristics, determination of transistor parameters (input and output) dynamic resistance,current amplification factor.

(b) Common emitter configuration: current relations in CE configration, collector current interms of base current and leakage current (ICEO), relationship between the leakage current in CB and CE configuration, input and output characteristics, determination of dynamic input and output resistance and current amplification factor B from the characteristics.

(C) Common collector configuration: Expression for emitter current in terms of base current and leakage current in CC configuration.

5.3 Comparision of CB and CE configuration with regards to dynamic input and output resistance, current gain and leakge current performance of CE configuration for low frequency voltage amplification. Typical application of CB configuration in amplification.

5.4 Transistor as an amplifier in CE configuration.

(a) DC load line, Its equation and drawing it on collector characteristics.

(b) Determination of small signal voltage and current gain of a basic transistor amplifier using CE output characteristic and DC load line, Concept of power gain as a product of voltage gain and current gain.

6 TRANSISTOR BIASING AND STABILIZATION OF OPERATING POINT:

6.1 Different transistor biasing circuits for fixing the operating points, effect of temperature on operating point. Need and method for stabilization of operating point.Effect of fixing operating point in cut-off or saturation region on performance of amplifier.

6.2 Calculation of operating point for different biasing circuits, use of Thevenin's theorem in analysing potential divider biasing circuit.

6.3 Simple design problems on potential divider biasing circuit.

7 SINGLE STAGE TRANSISTOR AMPLIFIER:

7.1 Analysis of Single Stage CE, CB and CC amplifier.

7.2 Single stage CE amplifier circuits with proper biasing compontents.

7.3 AC load line and its use in :

(a) Calculation of current and voltage gain of a single-stage amplifier circuit.

(b) Explanation of phase reversal of the output valtage with respect to input voltage.

8. FIELD EFFECT TRANSISTOR (FET)

8.1 Construction, operation, characteristics and Biasing of Junction FET.

8.2 Analysis of Single Stage CS, CG and CD amplifiers. (Only Brief Idea)

9. MOSFET :

9.1 Construction, operation, Characteristics and Biasing of MOSFET in both depletion and enhancement modes.

9.2 Analysis of Single Stage CS, CG and CD amplifiers.(OnlyBrief Idea)

10. CMOS :

10.1 Construction, operation and Characteristics of CMOS in both depletion and enhancement modes.

10.2 Use of CMOS as Invertor, Different application of CMOS, CMOS IC.

10.3 Comparison of JEET, MOSFET and Bipolar transistor.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year I Semester

ELECTRONIC COMPONENTS & DEVICES
LIST OF PRACTICALS

1. Semiconductor diode characteristics:
   (i) Identifications of types of packages, terminals and noting different ratings using data books for various types of semiconductor diodes (Germanium, point contact, silicon low power and high power and switching diode).
   (ii) Plotting of forward V-I characteristics for a point contact and junction P-N diode (Silicon & Germanium diode).
2. Rectifier circuits using semiconductor diode, measurement of input and output voltage and plotting of input and output wave shapes
   (i) Half wave rectifier.
   (ii) Full wave rectifier (centre tapped and bridge rectifier circuits)
3. To Plot forward and reverse V-I characteristics for a zener diode.
4. To Plot wave shapes of a full wave rectifier with shunt capacitor, series inductor and n filter circuit.
5. To Plot the input and output characteristics and calculation of parameters of a transistor in common base configuration.
6. To Plot input and output characteristics and calculation of parameters of a transistor in common emitter configuration
7. Transistor Biasing circuits
   (i). Measurement of operating point (Ic & Vce) for a fixed bias circuit.
   (ii).Potential divider biasing circuits.
   (Measurement can be made by changing the transistor in the circuits by another of a same type number.
8. Plot the FET characteristics and determination of its parameters from these characteristics.
9. Measurement of voltage gain and plotting of the frequency response curve of a JFET amplifier circuits.
10. Measurement of voltage gain and plotting of the frequency response curve of a MOSFET amplifier circuits.
11. Single stage Common Emitter Amplifier Circuits
    (i). Measurement of voltage gain at 1 KHZ for different load resistance.
    (ii) Plotting of frequency response of a single stage amplifier circuit.
    (iii) Measurement of input and output impedance of the amplifier circuit.
12. Familarization with lan instrument (Multimeter/CRO), etc.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year I Semester

DEC-106 TECHNICAL DRAWING

INSTRUCTIONAL OBJECTIVES :

At the end of the instruction in the subject, the learner should be able to :-

1. Draw free hand sketches of the schematic diagrams of electronic circuits, using standard symbols.
2. Prepare drawing from the rough sketches provide and/or enlarge/reduce the given drawing to the desired scale.
3. Draw exploded views of components & assemblies in preparation of service drawing.
4. Draw wiring diagram & make parts list;
5. Draw various views of the object using orthographic projection.
6. Identify the object when plan, elevation & views of the same are given .
7. Re arrange block representation of the given circuits.

Prat-1 (Mechanical Drawing)

1. Free hand sketching :

1.1 Introduction of Engineering drawing & its significance in the field of engineering.
1.2 Need of standard practices in engineering drawing.
1.3 Standard practice as per IS-696-1972.
1.4 Free hand sketching; different types of lines, free hand lettering of different types

2. Care, handling & proper use of drawing instruments & materials:

2.1 Drawing instruments.
2.2 Materials used in drawing work.
2.3 Sheet size, layout & planning of drawing sheet (familarity sheet size, layout & planning of drawing sheet (familiarity with standared paper sizes, e.g A4, A3 & A2 and their mutual relationship)

.

3. Lettering techniques and practice

3.1 Free hand drawing of letters & numerals in 3, 5, 8 & 12 mm seriws, vertical upright and inclined at 75o.
3.2 Instrumental single stroke lettering in 12 mm.
4. Dimensioning Techniques :
4.1 Necessity of dimensioning, appropriate methods of dimensioning, their merits and demerits, selection of proper dimension technique.
4.2 Requirements of view for complete dimensioning.

5. Projection :

5.1 Principle of Projection-I

(a) Recognition of objects from the given pictorial view.
(b) Identification of surfaces from different objects &pictorial views.
(c) Exercise on missing surfaces (views).
(d) Sketching practice of pictorial views objects given.

5.2 Principle of Projection-II.

(a) Principle of orthographic projections.
(b) Three views of given object.
(c) Six views of given object.
(d) From shapes of inclined surfaces.
(e) Invisible lines, centre lines, extension & dimensioning lines.
(f) Location & drawing of missing lines.

6. Sections :

6.1 Importance of sectioning.
6.2 Method of representing the section.
6.3 Conventional sections of different materials.
6.4 Types of sections ;types of breaks, aligned sections.
6.5 Sectioning of simple objects like brackets, pulleys etc.

7. Details & Assembly drawing :

7.1 Symbols used to show joints in chasis & frames.
7.2 Principles of detail & assembly drawing ;part cataloguing.
7.3 Practical exercises of drawing exploded views of machine components & making assembly drawing.

NOTE :

1. Whenever possible drawing work should involve examples relevant to electronics discipline.
2. Examples from electronics parts catalogue, views of machine electronic equipment, chassis, consoles, PCB (Printed Circuit Board) Hi Fi cabinets etc. may be used.

PART-II (ELECTRONICS DRAWING)

1**. Draw the standard symbols of the following** :

(Different pages of ISI standard IS; 2032 may be referred):

1.1 **(a) Resistors Capacitors**: Fixed, preset, variable, electrolytic and ganged tpes.
(b) Inductors : Fixed, tapped and varible types, RF & AF chokes, Air cored, Solid cored & laminated cored.
(c) Transformers : Step-up, step-down. AF & RF types, Auto-transformer, IF transformer. Antenna, Chassis, Earth, Loudspeaker, Microphone, Fuse Indicating lamp, Coaxial cable, Switches-double pole single throw (DPST), Double pole throw (DPT) and Rotary types, terminals and connection of conductors.

1.2. **Active Devices:**

(a). Semiconductor : Rectifier diode, Zener diode, Varacter diode, Tunnel diode, Photo, Light emitting diode (LED), Bipolar transsitor, junction field effect transistor (JFET), Mosfet, Photo transistor, Uni junction transistor (UTJ), Silicon control rectifier (SCR), Diac, Triacs outlines (with their types numbers e.g. TO3, TO5, TO18, TO39, TO65 etc) of the different types of semiconductor diodes, Transistors Scrs, Diacs, Triacs and ICs (along with indicators for pin identification etc.)

1.3. Telephone components :

(a). Telephone Instrument/Components : Transmitter, Receiver, Filters & Hybrid transformer.

1.4. Draw standard symbols of NOT, AND, NAND, OR, NOR XOR, Expandable & Tristate gates, Op, Amp, Ic, Flip-flops (Combination of 2,3,4 input gates should be drawn).

2. Draw the following : (With the help of rough sketch/clues given).

2.1 Circuit diagram of a Wein' bridge oscillator.
2.2 Circuit diagram of a Battery eliminator.
2.3 Block diagram of a typical Radio receiver.
2.4 Block diagram of an Electronic multimeter.
2.5 Circuit of Emergency light.
2.6 Circuit diagram of Voltage stabilizers.
2.7 Circuit diagram of Fan regulator.
3. Connection wiring diagrams.
3.1 Point to point pictorial.
3.2 Highway or trunk line.
3.3 Base line or air line.

Exercise on reading & interpreting of wiring diagrams.

4. Graphical Representation of Data : General concept, selection of varibles & curve fitting, curve indentification zero point location. Use of various graph paper and perparation of diagram from given data. Bar charts, pie graph, pictorial graph.
5. Given the block diagram of a radio receiver on A-4 size, enlarge the same to A-2 size.
6. Given the block diagram of a TV receiver in A-1/A-2 size, reduce it to A-3 size.
7. Convert a rough block diagram sketch on A-4 size to a finished block diagram on A-2 size.
8. P.C.B layout of a single electronic circuit on a graph sheet.
   Keeping in view the actual size of the components.

PART-III (INSTRUMENTATION & CONTROL DRAWING)

Drawing of common symbols use in instrumentation and signal flow graph in control systems. (Only For Instrumentaion & Control Engineering)

INSTRUMENTATION SYMBOLS :

Locally mounted instruments, Instruments at control centre, Instrument with two services, Transmitter, Pneumatic control valve, Hydraulic control valve, Solenoid volve, Safety valve, Self operated controller, Process line On-Fire sensor, Point of measurement, Fluid Pressure Line, Electric line, Pneumatic line, Capillary line, Special type of valves, Method to differentiate various process line using current, Identification table for instrumentation diagram.

Instrumentation diagram of process unit (At least two diagram should be drawn on one sheet)

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year II Semester
DEC-201 APPLIED MATHEMATICS I (B)

1. INTEGRAL CALCULUS - I :

Methods of Indefinite Integration :-

1.1 Integration by substitution.
1.2 Integration by rational function.
1.3 Integration by partial fraction.
1.4 Integration by parts.

2. INTEGRAL CALCULUS -II :

2.1 Meaning and properties of definite integrals, Evaluation of definite integrals. Integration of special function.
2.2 Application : Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution, centre of mean of plane areas.
2.3 Simposns 1/3rd and Simposns3/8th rule and Trapezoidal Rule : their application in simple cases.

3. CO-ORDINATE GEOMETRY (2 DIMENSION):

3.1 CIRCLE : Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.
3.2 Standard form and simple properties
Parabola x2=4ay, y2=4ax,
Ellipse x2 y2 -- + --=1 a2 b2
Hyperbola x2 y2 --- - ---=1 a2 b2

4. CO-ORDINATE GEOMETRY (3 DIMENSION):

4.1 Straight lines and planes in space - Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line and Plane (Different Forms),
4.2 Sphere $x^2 + y^2 + z^2 + 2gx + 2fy + 2wz=d$ (Radius, Centre and General Equation)

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year II Semester

DEC-202 APPLIED PHYSICS-II

1. Optics :

Nature of light, Laws of Reflection and Refraction, Snell's Law, Interference (Constructive and Destructive), Diffraction and Polarization (Concept Only), Law of Mallus and Polaroid's.

2. Introduction To Fibre Optics :

Critical angle, Total internal reflection, Principle of fiber optics, Optical fiber, Pulse dispersion in step-index fibers, Graded index fiber, Single mode fiber, Optical sensor.

3. Lasers and its Applications :

Absorption and Emission of energy by atom, Spontaneous and Stimulated Emission, Population inversion, Main component of laser and types of laser- Ruby Laser, He-Ne laser and their applications. Introduction to MASER.

4. Electrostatics :

Coulomb's Law, Electric field, Electric potential, Potential energy, Capacitor, Energy of a charged capacitor, Effect of dielectric on capacitors.

5. D.C. Circuits :

Ohm's Law, Kirchoff's Law and their simple application, Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); Carey Foster's bridge, potentiometer.

6. Magnetic Materials and Their Properties:

Dia, Para and Ferro-magnetism, Ferrites, Magnetic Hysteresis Curve and its utility. Basic idea of super conductivity, Meissner's effect.

7. Semiconductor Physics :

Concept of Energy bands in solids, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, Electrons and holes as charge carriers in semiconductors, P-type and N-type semiconductors.

8. Junction Diode and Transister :

Majority and Minority charge carriers P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics, Formation of transistor, transistor-action, Base, emitter and collector currents and their relationship LED's.

9.Introduction To Digital Electronics :

Concept of binary numbers, Inter conversion from binary to decimal and decimal to binary. Concepts of Gates (AND, NOT, OR).

10. Non-conventional energy sources:

(a) Wind energy : Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill.

(b) Solar energy: Solar radiation and potentiality of solar radiation in India, uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)

I Year II Semester

DEC-202 APPLIED PHYSICS-II

PHYSICS LAB

Note: Any 4 experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.
2. Determination of 'g' by plotting a graph T2 verses l and using the formula g=4n2/Slope of the graph line
3. Determine the force constant of combination of springs incase of 1. Series 2. Parallel.
4. To verify the series and parallel combination of Resistances with the help of meter bridge.
5. To determine the velocity of sound with the help of resonance tube.
6. Determination of viscosity coefficient of a lubricant by Stoke's law.
7. Determination of E1/E2 of cells by potentiometer.
8. Determination of specific resistance by Carry Foster bridge.
9. Determination of resistivity by P.O.Box.
10. Verification of Kirchhoff's Law.
11. To draw Characteristics of p-n Junction diode.
12. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.

NOTE :

Students should be asked to plot a graph in experiments (where possible) and graph should be used for calculation of results. Results should be given in significant figures only.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year II Semester
DEC-203 ENGINEERING MECHANICS AND MATERIALS

1. Introduction:

Mechanics and its utility. Concept of scaler and vector quantities. Effect of a force.Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

2. Forces Analysis:

Concept of coplaner and non-coplaner forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a praticle, conditions of equilibrium of coplaner concurrent force system.

3. General Condition of Equilibrium:

General condition of equilibrium of a rigid body under the action of coplaner forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

4. Stresses and strains:

Concept of stress and strain. Concept of various types of stresses and strains. Definitions of tension, compression shear, bending, torsion. Concept of volumetric and lateral strains, Poisson's ratio. Mechanical properties of MS, SS, CI, Al and etc.

5. Beams & Trusses:

Definition of statically determinate and indeterminate trusses. Types of supports. Concept of tie & strut, calculation of reaction at the support of cantilever and simply supported beams and trusses. (simple problems only)

6.A. MATERIALS & CONCEPT USED IN ELECTRONICS :

Soldering materials - Type, chemical composition and properties, Soldering alloys - Tin lead, Tin antimony, Tin silver, Lead silver, Tin zinc, Different types of flux and their properties, Properties of plastics materials, Epoxy materials for PCB (Single and multi layer board), Emulsion parameters, Film emulsion, Type of laminates (Phenolic, Epoxy, Polyster, Silicon, Melamine, Polymide), Properties of copper clad laminates, Material (Filler, Resin, Copper Foil Photo printing basic for double side PCB, Photo resin materials coating process materials, Screen printing and its materials Etching agent, Film processing and used materials.

(B) Soldering & Brazing: For black Galvanised and Tincoated Iron sheet, brass and copper sheets only.

(1) Its concept, comparison with welding as joining method and classification, electric soldering and forge soldering.

(2) Soldering operation- edge preparation of joints, Pickling and degreasing, Fluxing, Tinning and Soldering. Wave soldering, solder mask, Dip soldering, Drag soldering,

(3) Materials Used-Common fluxes, soft and hard solder, solder wire (Plain and Resin core) and sticks, spelters and their specifications and discription (For Identification Only), forge soldering bits.

(4) Electric soldering iron, other soldering tools.

(5) Common defects likely to occurs during and after soldering.

(6) Safety of Personnel, Equipment & Tools to be observed.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year II Semester

DEC-204 ELECTRICAL ENGINEERING-I

1. CLASSIFICATION:

Classification of materials into Conducting materials, Insulating materials,Semi-conducting materials with reference to their atomic structure.

2. CONDUCTING MATERIALS:

A. Resistivity and factors affecting resistivity such as temperature, alloying and mechanical stressing.

B. Classification of conducting materials into low resistivity & high resistivity materials. Some examples of each and their typical applications.

3. INSULATING MATERIALS:

A. Electrical Properties:

Volume resistivity, Sarface resistance, Dielectric loss, Dielectric strength (Break down valtage) and Dieclectric constant.

B. Chemical Properties:

Solubility, Chemical resistance, Weather ability.

C. Physical Properties:

Hygroscopicity, tensile &Compressive strength, Abrassive resistance, Brittleness.

D. Thermal Properties:

Heat resistance, classification according to permissible temperature rise, Effect of electrical overloading on the life of an electrical appliance.

E. Plastic Insulating Materials:

Classification into thermoplastic and thermosetting catagories, examples of each and their typical applications.

3. MAGNETIC MATERIALS:

A. Ferromagnetism, domains, permeability, hysterisis loop- (including coerrecive force and residual magnetism) and magnetic saturation.

B. Soft and Hard magnetic materials, their example & typical applications.

5. SEMI CONDUCTOR AND SPECIAL PURPOSE MATERIALS:

N-type and P-type materials, application of semi-conductor materials, materials used in transistor and I.C. manufacture.

6. D.C. CIRCUITS:

(i) Ohm's law, resistivity, effect of temperature on resistances, heating effect of electric current, conversion of mechanical units into electircal units.

(ii) Kirchoff's laws, application of Kirchoff's laws to solve, simple d.c. circuits.

(iii)Thevenins theorem, maximum power trasfer theorem, Norton's theorem and super position theorem, simple numerical problems.

7. ELECTROSTATICS:

(i) Capacitance and capacitor, definition, various types.

(ii) Charging and discharging of a capacitor, growth and decay of current in a capacitive circuit.

(iii) Energy stored in a capacitor.

(iv) Capacitance in terms of dimensions of parallel plate capacitor.

(v) Dielectric constant of material, Break down voltage of a capacitor.

(vi) Series and parallel connection of capacitors.

8. ELECTRO MAGNETISM:

(i) Concept of mmf, flux, reluctance and permeability.

(ii) Energy stored in a magnetic field and an inductor.

(iii) Solution of problems on magnetic circuits.

(iv) Faraday's laws of electromagnetic induction, Lenz's law, Physical explanation of self and mutual inductance.

(v) B-H curve, Hysteresis, Eddy currents elementary ideas & significance.

(vi) Growth and decay of current in an inductive circuit.

(vii) Force between two parallel current carrying conductors & its significance.

(viii) Current carrying conductor in a magnetic field and its significance.

9. A.C. THEORY:

(i) Concept of alternating voltage and current, difference between A.C and D.C..

(ii) Generation of alternating voltage, equation of sinusoidal waveform.

(iii) Definition and concept of cycle, frequency, Time period, amplitude, instantaneous value, average value, RMS value, peak value, form factor, Peak factor.

(iv) Phase and phase difference, representation of alternating quantities by Phasor, addition and subtraction of alternating quantities.

10. BATTERIES:

(i) Construction of lead acid and nickel cadmium batteries.

(ii) Charging and maintenance of batteries.

(iii) Rating of batteries.

(iv) Back up batteries (Lithium & Silver Oxide batteries)

(v) Shelf life of batteries.

11. TRANSIENTS & HARMONICS:

Introduction, Types of transients, Important differential equations, First and Second order equations, Transients in R-L series circuits (D.C.), Short circuit current, Time constant, Transients in R-L series circuits (A.C.), Transients in R-C series circuits (D.C.), Transients in R-C series circuits (A.C), Double energy transients. Fundamental wave and harmonics, Different complex waveforms, General equation of complex wave, R.M.S. value of a complex wave, Power supplied by complex wave, Harmonics in single phase a.c. circuits, Selective resonance due to harmonics, Effect of harmonics on measurement of inductance and capacitance

ELECTRICAL ENGINEERING-I LAB:

LIST OF PRACTICALS:

1. Ohm's law verification.
2. To verify the laws of series and parallel connections of resistances i.e. to verify:-
   (i) The total resistance in series connections.
   RT=R1+R2+R3.....
   Where RT is the total resistance and R1,R2,R3 etc are the resistances connected in series.
   (ii) The total resistance in parallel connections.
   1/RT=1/R1 + 1/R2 + 1/R3.....
   Where RT is the total resistance and R1,R2,R3 etc. are the resistances connected in parallel.
   Also to conclude that the total resistance value of a parallel circuit is less than the any individual resistance.
3. To verify Kirchoff's following laws:-
   (i) The algebric sum of the currents at a junction is zero.
   (ii) The algebric sum of the e.m.f. in any closed circuit is equal to the algebric sum of IR products (drops) in that circuit.
4. To measure the resistance of an ammeter and a voltmeter and to conclude that ammeter has very low resistance whereas voltmeter has very high resistance.
5. To verify Thevenin's and maximum power transfer theorems.
6. To find the ratio of inductance values of a coil having air core and iron core respectively and thus see that by the introduction of a magnetic material inside the coil,the inductance value of the coil is substantially increased.
7. To verify the relation:-
   CT=(C1*C2)/(C1+C2) and CT=C1+C2
   For two capacitors, connected in series and parallel respectively.
8. To test a battery for charged and discharged conditions and to make connections for its charging.
9. To show that the range of an ammeter (d.c. and a.c.) and a voltmeter (d.c. and a.c.) can be extended with the use of shunts and multiplier.
10. To convert the given galvanometer into a voltmeter and an ammeter.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
I Year II Semester

DCE-206 ELEMENTARY WORKSHOP PRACTICS

I- FITTING SHOP

Topic	Knowledge/Skill
1. Types and use of making and measuring tools including micrometer, slide callipers, varnier gauge, feeler gauge, sphero meter.	Select and use correct tools to and measure as needed, Ability to measure wire and Sheet gauge, diameter, Radius dimension.
2. Types and use of vice, Clamps Chisel, Hammer, Punch for metal work.	Select and made correct use of appropriate tool for specified job.
3. Types and use of files for Soft and Hard metal/Alloys, Sheets.	Select and made correct use of files on specified materials.
4. Types and use of Grinding Machine, Grinding polishing Machine on Matals/Laminates.	Select and made correct use of appropriate machines and tools for specified grinding, buffing polishing operations.
5. Types and use of Hacksaw Power saw and Blades on soft and hard metals / Alloys / Laminates/Sheets.	Select and made correct use of appropriate saw and blade for specified job.
6. Types and use of Drilling Machine, Drill Bits, Drill Speeds, Including counter sinking on Metals, Alloys, Sheet Metal.	Select and made correct use of appropriate Drilling machine tools for Drilling and counter on specified job.
7. Types and use of Tapes and Dies for internal and external threading.	Select and made correct use of appropriate tools to cut specified job.
8. Types and use of fastening tools and accessories such as nuts, bolts, washers, self taping, screws drivers, allen key, riveting tools and rivet for metal and sheet metal.	Select and made correct use of appropriate tools and fastening materials to carry out a fastening operation on specified job

9. Techniques of Binding and Folding Aluminium pipes upto 12 mm. diameter. (Exemple Practice Antenna marking) Jobs to be Made :	Ability to bend aluminum pipes of a given size to a specified job shape.

1. Hacksawing and Chipping of M.S.
2. Filling Chipped M.S job.
3. Fitting on rectangular or wquare M.S. job.
4. Making trangular squar or Haxagonal figure inside of M.S. job.
5. Utility article to prepare calliper, screw driver or try square.

II-SHEET METAL SHOP

Topic	Knowledge/Skill
1. Types and use hand tools for sheet metal work cross pein, straight pein, ball pein mallet selection.	Select and make correct use of appropriate materials and tool for specified sheet metal job.
2. Types and use of hand shear quillentiness for sheet cutting.	Select and make correct use of appropriate tools/machine for Cutting sheet metal specified dimensions.
3. Techniques of grooving creasing, folding, corner making, bending, circle cutting.	Ability to perform the specified operation on sheet metal to a given tolerance.
4. Types and use of engraving tools and machines or sheet metal.	Ability to engrave simple words on sheet metal.

Jobs to be Made :

1. (a) Cutting shearing & bending.
   (b) Brazing practice on small pieces.
2. Making a soap case with M.S. sheet.
3. Making a funnel with tin sheet & soldering the same.
4. Making a cylinder & soldering the same.
5. Preparation of different types of joints such as Lap joint-single seam, Double seam & Cap joint & Hemp & wired edge.

III-PAINTING SHOP

Topic	Knowledge/Skill
1. Techniques of sheet metal cleaning and surface treatment for spray painting.	Ability to prepare and treat surface appropriate before spray painting.
2. Types of paints, solvants, thinners, removers, brushes, use and care of brushes, paint	Ability to select and correctly use of appropriate paint remover, solvant, brush,

preparation. brushes	ability to prepare paint and take care
3. Technique of spray painting and use of stencils on paint letters and figures on sheet metal.	Ability to spray paint on Sheet metal to a specified finish.

Job to be Made :

1. Preparation of wooden surface for paper basket or paper tray & painting & polishing the same.
2. To prepare a metel surface

IV-WOOD AND LAMINATE SHOP

Topic	Knowledge/Skill
1. Types important properties comparative costs of wood, playwood various particle board, veneers, formica, Bakelite, perspex and common aminities used for making Cabinets, Frames, consoles in the electronics field.	Identify commonly used materials state important properties, estimate cost. Select correct materials(s) for a given assignment.
2. Types important properties comprative cost use of covering materials such as artifical leather, Felt, Cloth, Frams, various types of Trims such as Aluminium strips channels corners grills.	Identify commonly used state important properties estimate cost, select correct materials for the given assignment.
3. Types and use of planner, big saw, band saw, circular saw, various blades, Gullotine for Laminate and wood cutting, Necessary precautions.	Select and correctly use of appropriate Saw / Machine for wood, Laminate paring, cutting to specified shape and size.
4. Types and uses of hand saw, wood chisel, Wood files, Auger, Drill Counter, Sinking, sanding for woods and Laminates.	Select and correct use of appropriate tools for carrying out specified operation to a finish.
5. Techniques of fastening wood and laminates with nails, screws, adhesives.	Ability to fasten wood and liminates as specified.
6. Techniques of working on perspex-cutting shaping, Drilling, hole cutting joining with chloroform	Ability to cut, Join, Drill shape perspex to a given specification.

7. Techniques of fixing formica, venner, felt, artifical leather, rexin, foam, grills, trims on wood, chip board and laminates using adhesives, nails as required.	Ability to perform given fastening operation to given specification.
8. Techniques of engraving simple pattern, letters on bakelite, perspex, formica and	Ability to engrave simple patterns and letters on liminates similar.

Jobs to be Made :

1. Plainning & Sawing Practice.
2. Lap joint.
3. Motric & Tenon joint.
4. Dovetial joing.

NOTES :

1. Each three period pratical session is to be precebed by one period tutorial session for demonstration/theory lessons.

2. Extensive use of illustrative display showing correct use, limitations precautions, properties (As applicable) of materials, tools, Machines should be used for teaching purpose. Teacher-student activity schedule should be prepared to ensure that the required knowledge / skill transfer takes place.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year III Semester

DEC-301 Functional Communication

Section "A" (English)
Text Lessons

Unit I.	On Communication
Unit.II	Exploring Space
Unit.III	Sir C.V. Raman
Unit.IV	Professional Development of Technicians
Unit.V	Buying a Second Hand Bicycle
Unit.VI	Leadership and Supervision
Unit.VII	First Aid
Unit.VIII	The Romanance of Reading
Unit.IX	No Escape from Computers
Unit.X	Bureau of Indian Standards

Section "B" Hindi

1- स्वरोजगार
2- भारतीय वैज्ञानिकों एवं तकनीकियों का भारत के विकास में योगदान
3- ग्राम्य विकास
4- परिवार नियोजन
5- सामाजिक संस्थायें
6- नियोजन और जन कल्याण
7- भारत में प्रौद्योगिकी के विकास का इतिहास
8- हरित क्रांन्ति
9- पर्यावरण एवं मानव प्रदू ाण
10- श्रमिक कल्याण
11- भारत में श्रमिक आन्दोलन

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year III Semester

DEC-302 APPLIED MATHEMATICS II

1. **MATRICES :**

1.1 Algebra of Matrices, Inverse : Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermition, Orthogonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix. Definition and Computation of inverse of a matrix.

1.2 Elementary Row/Column Transformation :Meaning and use in computing inverse and Rank of a matrix.

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

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

2. **DIFFERENTIAL CALCULUS :**

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

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

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

3. **DIFFERENTIAL EQUATION:**

3.1 Formation, Order, Degree, Types, Solution :Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, Nonlinear equation.
3.2 First Order Equations: Variable seperable, equations reducible to separable forms, Homogeneous equtions, eqution reducible to homogeneous forms, Linear and Bernoulli form exact equation and their solutions.
3.3 Higher Order Linear Equation :Property of solution, Linear differential equation with constant coefficients (PI for X=eax, Sin ax, Cos ax, Xn, eaxV, XV.
3.4 Simple Applications : LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

4. INTEGRAL CALCULUS - II:

4.1 Beta and Gamma Functions: Definition, Use, Relation between the two, their use in evaluating integrals.

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

4.3 Laplace Transform : Definition, Basic theorem and properties, Unit step and Periodic functions, inverse Laplace transform, Solution of ordinary differential equations.

5. PROBABILITY AND STATISTICS:

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

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

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year III Semester

DEC-303 ELECTRICAL ENGINEERING-II

1.0 A.C.THEORY

1.1 Representation of sinusoidal quantities by Phasor

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

(a) Pure resistance,
(b) Pure inductance and
(c) Pure capacitance.

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

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

(a) Resistance and inductance in series,
(b) Resistance and capacitance in series.

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

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

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

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

2. THREE PHASE SUPPLY:

2.1 Elementary idea about 3-phase supply.

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

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

2.4 Comparison between three phase and single phase supply.

3. TRANSFORMERS:

3.1 Principle of operation.

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

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

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

4. D.C. MACHINES:

(a) D. C. Generator:

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

(b) D. C. Motor:

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

(c) Starters for D.C. Machines

5. SYNCHRONOUS MACHINES:

(a) Alternators:

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

(b) Synchonous Motors:

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

(c) Application of synchonous machines.

6. INDUCTION MOTORS:

(a) Three Phase Induction Motor:

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

(b) Single Phase Induction Motor:

Principle of operation and constructional details of single phase FHP induction motors (Split phase, capacitor start capacitor run, shaded pole, reluctance start, A.C. series, universal, hysterisis, servo and stepper motors their applications).

(c) Starters for Induction motors.

List of Experiments

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

Also to determine how to reverse the direction of rotation.

11. To start a Three Phase induction motor and to determine its slip at various loads.
12. To determine V curves of a synchronous motor.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year III Semester
DEC-304 ELECTRONIC DEVICES AND CIRCUITS

1. SINGLE STAGE AMPLIFIERS:

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

2. MULTISTAGE TRANSISTOR AMPLIFIERS:

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

3. TRANSISTOR AUDIO POWER AMPLIFIERS:

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

4. FEED BACK AMPLIFIERS:

4.1 Basic principle and types of feed back.
4.2 Derivation of expression for the gain of an amplifier employing feed back.
4.3 Effect of negative feedback on gain, stability, distortion and band width (Only physical explanation)
4.4 Typical feedback circuits :
(a) A.C. coupled amplifiers with emitter by-pass, capacitor removed.

(b) Emitter follower and its application, simple mathematical analysis for voltage gain and input impedance of above circuits.

5. TUNED VOLTAGE AMPLIFIERS:

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

6. SINUSOIDAL OSCILLATORS:

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

7. WAVE SHAPING CIRCUITS:

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

8. MULTIVIBRATOR CIRCUITS:

8.1 Ideal transistor switch; explanation using C.E. output characteristics, calculation of component values (collector and base resistors) for a practical transistor switch.
8.2 Transistor switching time. Use of speed up capacitor (Physical explanation).
8.3 Basic concept of working of collector coupled bistable, monostable and stable multivibrator circuits including principle of triggering.
8.4 Operation of Schmitt trigger, calculation of upper trigger potential (UTP) and lower trigger potential (LTP).
8.5 Mention of applications of multivibrators and Schmit trigger. Its use as waveform generator.
8.6 Transistorised voltage controlled oscillator (basic) principle only.
8.7 Mention of at least one polular IC with its block diagram, Pin configuration and it working of each type of Multivibrator circuits.

9. OPERATIONAL AMPLIFIERS:

9.1 Specifications of ideal operational amplifier and its block diagram.

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

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

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

10. Timer Ic.:

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

11. Regulated Power Supply

11.1 Concept of regulation.

11.2 Basic regulator circuits (using zener diode).

11.3 Concept of series and shunt regulator circuits.

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

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

12. Introduction to Microelectronics-

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

DEC-304 ELECTRONIC DEVICES AND CIRCUITS LAB

List of Experiment

1. To measure the overall gain of two stage R.C. coupled amplifier at 1 Khz and note the Effect of loading of second stage on the first stage.
2. To plot the frequency response of R-C soupled amplifier.
3. (a) To plot the load Vs output power characteristics to determine the maximum signal input for undistorted signal output.
   (b) The above experiment is to be performed with single ended power amplifier; Transistorized push; pull amplifier; Compl-ementary Symmetry power Amplifier.
4. To observe the effect of a by-pass capacitor by measuring voltage gain and plotting of Frequency response for a single stage amplifier.

5. To measure input and output impedance of a feedback amplifier with and without by-pass capacitor.
6. Measurement of voltage gain input and output impedance and plotting of frequency response of an emitter follower circuit.
7. Measurement of resonant frequency, plotting of the response curve (i.e. graph between inputs Frequency and impedance) and calculation of Q with the help of this curve for series and Parallel Resonant circuit.
8. To measure the frequency response of a single stage tuned voltage amplifier and calculation of the Q of the tuned circuit load.
9. Observe and plot the output wave shapes of;
   (a) R-C differentiating circuits.
   (b) R-C integrating circuits for square wave input (Observe the effect of R-C time constant of the circuits on the output wave shape for both the circuits).

10. (a) Observe the output waveforms of given biased and unbiased series and shunt clipping circuits, for positive and negative peak clipping circuits, for positive & negative peak clipping of a sine wave using switching diodes & D-C sources and compare it with input wave.
    (b) Observe the output wave shape of given double clipper circuit using diodes and D-C sources.
    (c) Observe the output wave shape of given zener diode and transistor clipper circuits for positive peak, negative peak and double clipping sine (or other) wave shapes.

11. To clamp square wave to their positive and negative peaks and to a specified level.
12. To measure Ic and Vce for transistor when Ib is varied from zero to maximum value and measure the valur of Vce and I for saturation at a given supply, voltage and load.
13. To test a transistor schmitt trigger circuit, observe and plot the waveshapes at various points.
14. Use of Op-Amp. (For IC-741) as Inverting and non-inverting amplifier, adder, comparator, buffer, scale changer.

15. Simple working circuits using NE555.

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

17. To test adjustable IC regulator and current regulator.

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

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year IV Semester
DEC- 401 PROGRAMMING IN C &C++

1. **CONCEPT OF PROGRAMMING:**
   Concept of Flowcharting, algorithm, programming, Structured Programming Various techniques of programming, Use of programming.

2. **PROGRAMMING IN C:**
   Data Types, Operators and Expressions; Input & Output printf, scanf, clibrary Control Statement: IF- ELSE, While, For, Do- While, Switch; Functions and modular programming; Scope of variables, parameter passing, recursion, block structure; preprocessor statements; pointers and arrays; structures and unions; File handling.

3. **CLASSES & OBJECT:**
   What is a class, what is an object, constructors, types of object (external, automatic static, Dynamic objects) Meta class, role of meta class. Scope of classes, array of objects, objects as a function argument.

4. **PROGRAMMING IN C++:**
   What is object-orientation, area of object technology, C++, getting to grips with C++(data types, escape sequence, characters, variables, operator, notation, Arrays, Function conditional statements. call by value, call by reference. Pointer : C++ memory map, dynamic allocatio pointers, pointers with arrays. Structure, structure with arrays, passing, structure of function. Enumerated data types, Inherentance, apolymorphism & Overloading.

LIST OF EXPERIMENTS

1. Exercises involving output and input format controls in Pascal.
2. Exercises involving control transfer statements in C & C++
3. Exercises with arrays & Pointers in C & C++.
4. Exercises with functions in C & C++.
5. Exercises with files in C & C++.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year IV Semester

DEC-402 NETWORK, FILTERS AND TRANSMISSION LINES

1. REVIEW OF NETWORK THEOREMS:

Review of the following, network theorem; superposition Thevenin's Norton's and maximum power transfer.

2. NETWORKS:

2.1 One Port Network : Series and parallel tuned circuit, expression for their impedance at any freququency and at resonance in terms of Q and component values (L. C. & R). Band width of tuned circuit in terms of resonance frequency and Q.

2.2 Two Port (Four Terminals Networks : Basic concept of the following terms

(a) Symmetrical and asymmetrical networks.
(b) Balanced and unbalance network,
(c) T-network, Ladder network, Lattice network, L Network, Bridge T-network.
(d) Representation of a two port " Block Box" in terms of Z, Y and H parameters and mention of application to transistor as a two port network.

3. SYMMETRICAL AND ASYMMETRICAL NETWORK :

3.1 Symmetrical Network :

(a) Concept and significance of characteristics impedance, propagation constant, attenuation constant, phase shift constant and insertion loss.
(b) Exprssion for characteristic impedance, propagation constant, attenuation constant and phase-shift constant in terms of Zo, Zoc and Zsc for the following
(i) T Network.
(ii) n (pi) Network.

3.2 Asymmertrical Network :

(a) Concept and significance of iterative impedance image impedance, image transfer constant and insertion loss.
(b) The half section (L-section) : Splitting of symmetrical T & n(pi) sections into half sections,derivation of iterative impedance, image impedance open and short circuit impedance of half section.

3.3 Star-Delta Transformation : Equivalence of T and n(pi) network.

4. ATTENUATORS:

4.1 Units of attenuation (decible and nepers)
4.2 General characteristics of attenuators.
4.3 Analysis and design of simple attenuator of following types

(a) Symmetrical T and n type.
(b) L type

5. FILTERS:

5.1 Brief idea of the uses of filters networks in different communication system.

5.2 Connecting of low pass, high pass, band pass and band stop filters.

5.3 Theorem connecting attenuation constant a and characteristics impedance (Zo) determination of cut off frequency constant K section.

5.4 Prototype filter section

(a) T and n low pass filter section.

- Reactance frequency characteristics of low pass and its significance.
- Attenuation Vs frequency; phase shift Vs frequency characteristics impedance Vs frequency of T and n.
- Simple design problems of prototype low pass section.

5.5 Active Filter:

Basic Concept of active filter and comparison with passive.

(a) Op. amp. intergrater circuit, basic low pass active filter, First and Second order low pass Butter worth filter - Frequency response.

(b) Op. amp. differentiator circuit, basic high pass active filter, First a Second order high pass Butter worth filter- Frequency response.

(c) Basic concept of band pass filter, Wide and narrow band pass active filter.

(d) Basic concept of band reject filter, wide and narrow band reject filter.

(e) All pass filter, Frequency response

5.6 Crystal Filter :

(a) Crystal and its equivalent circuit.

(b) Design properties of piezoelectric filters and their use.

5.7 Equalizers :General Introduction.

6. TRANSMISSION LINE:

6.1 Transmission lines and their application : Shapes of different types of transmission lines; including 300 ohm antenna feeder cable, 75 ohm co-axial cable, optical fiber cable, Also other different types of cables.

6.2 Distributed (or primary) constants of a transmission line equivalent circuit of infinite line;

6.3 Necessity of the concept of an infinite line; Definition of characteristic impedance of line ; concept of short line termination in Zo currents no voltages long an infinite line; graphical representation; propagation constent, attenuation and phase shift constant of the line.

6.4 Relationship of characteristics impedence, propagation canstant, attenuation constant and phase constant in term of distributed constants of the line, smith charts.

6.5 Conditions for minimum distortion and minimum attenuation of signal on the line; necessity and different methods of loading the communication lines.

6.6 Concept of reflection and standing waves on a transmission line; definition of reflection coefficient in terms of characteristics impedance and load impedance; Definition of standing wave ratio (SWR), relation between VSWR and voltage reflection coefficient, maximum impedance on a line in term of characteristics impedance and VWSR.

6.7 Transmission line equation; expression for voltage, current and impedance at a point on the lines for lines with and without losses. Expression for the input impedance of the line. Solving Transmission line problems using Smith Chart.

6.8 Input impedance of an open and short circuited line and its graphical representation.

6.9 Transmission line at high frequency, effect of high frequencies on the losses of a transmission line; Application of transmission line as a reactive components and imdedance transformer (e.g. quarter wave and half wave transformer).

6.10 Principle of impedance matching using single stub; comparison of open and short circuit stubs.

6.11 Expression for characteristic impedance of open wire and coaxial lines (No derivation).

DEC-402 NETWORK, FILTERS AND TRANSMISSION LINES LAB

LIST OF EXPERIMENT

1. Experimental verifications of the Thevenin's and Norton's theorem with an a.c. source.
2. Experimental verifications maximum power transfer theorem.
3. To measure the characteristics impedance of a symetrical T/n (pi) network.
4. To measure the image impedance of a given asymmetrical T/n (pi) networks.
5. To design and measure the attenuation of a symmetrical T/n(pi) type attenuator.
6. For a prototype low pass filter :
   (a) Determine the characteristics impedance experimentally.
   (b) Plot the attenuation characteristics.
7. For a prototype high pass filter :
   (a) Determin the characteristics impedance experimentally.
   (b) To plot the attenuation characteristic.
8. (a) To plot the impedance characteristic of a prototype band pass filter.
   (b) To plot the attenuation characteristic of a prototype band pass filter.
9. (a) To plot the impedance characteristic of m-derived low pass filter.
   (b) To plot the attenuation characteristic of a m-derived high pass filter.
10. To design Ist order and IInd order active LPF filter using IC 741 and draw the frequency response curve.
11. To design Ist order and IInd order active HPF filter using IC 741 and draw the frequency response curve.
12. Measurement of characteristics of a short transmission line.
13. Measurement of L & C of lossless transmission line.
14 Measurement of Zo of lossless transmission line.
15. Measurement of Attenuation of lossless transmission line.
16. Measurement of Velocity of Propagation in lossless transmission line.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year IV Semester

DEC- 403 PRINCIPLES OF COMMUNICATION ENGINEERING

1. INTRODUCTION

1.1 Brief idea of various types of communication system.
1.2 Need of modulation and demodulation in communication system.
1.3 Types of modulation-Brief description and typical application of AM, FM, phase modulation and pulse modulation (PAM, PPM and PCM).

2. AMPLITUDE MODULATION

2.1 Derivation of expression for an amplitude modulated wave. Carrier and side bands, modulation index and depth of modulation.
2.2 Relative power distribution in carrier and side bands.
2.3 Elementary idea of DSB, DSB-SC, SSB, SSB-SC modulation and their comparison.
2.4 Vestigial side band modulation and its application.

3. FREQUENCY MODULATION

3.1 Derivation of an expression for frequency modulated wave and its frequency spectrum (without analysis of Bassel = function) Modulation index, Maximum frequency deviation and deviation ratio.
3.2 Advantages and disadvantages of FM over AM in communication systems based on consideration of band width requirement and noise.

4. PHASE MODULATION

Expression of phase modulated wave and its comparison with frequency modulation.
(Brief introduction only)

5. PULSE CODE MODULATION

5.1 Elementry idea of sampling theory and pulse modulation; Shanon's theorm and coding technique, Quantization (Brief idea only).
5.2 Time Division and frequency division multiplexing, CDMA, WDMA, FDMA and TDMA (Brief Idea Only).
5.3 PCM system, Types of PCM and its application.
5.4 Digital Modulation Techniques (ASK, FSK, PSK, DPSK) (Brief Idea Only).

6. PRINCIPLE OF AM MODULATORS

6.1 Working principles and typical application of
- Collector Modulator.
- Base Modulator.
- Balanced Modulator.

6.2 Single-Side-Band (SSB) generation and its typical applications.

7. PRINCIPLE OF FM MODULATORS

7.1 Working principle and applications of reactance tube modulator, varactor diode modulator and armstrong phase modulator.
7.2 Limiter, pre-emphasis and de-emphasis in FM communication system.

8. DEMODULATION OF AM WAVES

8.1 Principle of demodulation of AM wave using diode detector circuit; concept of diagonal clipping and formula for RC time constant for minimum distortion (No derivation).
8.2 Comparison of typical diode detector circuits in a Radio and TV receiver.

9. DEMODULATION OF FM WAVES

9.1 Basic principles of detection of FM waves.
9.2 Foster-seely discreminator and its working principles.
9.3 Working of Ratio-detector circuit and its advantage over Foster-seely discriminator circuits.
9.4 Basic principle of Quadrature detection.

10. TRANSMITTERS

10.1 Classification of transmitters on the basis of power, frequency and modulation.
10.2 Block diagram of an AM transmitters and working of each stage. Low level and High level modulation.
10.3 Block diagram and working principle of reactance tube and Armstrong FM transmitters.

11. RADIO RECEIVER

11.1 Brief description of crystal and TRF radio receivers; Need for and principles of superheterodyne radio receiver.
11.2 Block diagram of super-heterodyne AM receiver, function of each block and typical waveforms at the input and output of each block.
11.3 Block diagram of an FM receiver, function of each block and wave/forms at input and output at different blocks.

12. ANTENNA AND PROPAGATION

12.1 Physical concept of radiation of electromagnetic energy from an antenna, relationship between the direction of electric and magnetic fields with direction of propagation; concept of polarization of EM waves.
12.2 Electromagnetic spectrum and its various range VLF, LF, HF, VHF, UHF, Micro wave, Optical waves etc.
12.3 Definition and physical concepts of the terms used with antennas like point source, gain, power gain, directivity aperture, effective area, rediation pattern, (field strength, power and phase) beam angle, beam width and radiation resistance.
12.4 Types of antennas-Brief description, characteristics and typical applications of medium wave antenna, shortwave antenna, HF antenna, VHF, UHF and Microwave antenna e.g., half wave dipole, ground plane, yagi and ferrit rod antenna in transistor receiver. Brief idea about Rhombic antenna, dish antenna, Horn, Parabolic reflector and Lens antenna.

12.5 Antenna arrays-Brief description of broad side and end fire arrays, their radiation pattern and application (without analysis);
12.6 Basic idea about different modes of radio wave propagation- ground wave propagation, space wave propagation and sky wave propagation, their characteristics and typical areas of application. (e.g. Medium wave, short wave,TV communication.)
12.7 Explanation of the terms-critical frequency, maximum usable frequency (MUF) and skip distance.
13. Communication Media:- Telephone Lines, Twisted Pair Wire, Co-axial Cable, Fibre optics.
14. Modems - Basic working principle of modems and their application
15. Multiplexers- Dightal Multiplexers- Synchronous and synchronous(Brief Idea Only).

DEC- 403 PRINCIPLEOF COMMUNICATION ENGINEERING LAB

LIST OF EXPERIMENTS

1. (a) To observe an AM wave on CRO produced by a standard signal generator using internal and external modulation.
   (b) To measure the modulation index of the wave obtained in above experiment.
   2. (a) To obtain an AM wave from a collector modulator circuit and observe the Am pattern on CRO.
   (c) To measure index of modulation of the AM signal for different level of modulation signal.
3. To obtain a FM wave from reactance tube modulator/voltage controlled oscillator (using 8038 of 566) circuit and measure the frequency deviation for different modulating signal.
4. To obtain modulating signal from an AM detector circuit and observe the pattern for different RC time constants and obtain its optimum value for least distortion.
5. To obtain modulating signal from a FM detector (Foster-seely/ Ratio detector/quadrature detector) Circuit (or using 2211 or PLL 565) and plot the detector characteristics.
6. To obtain AM-SB from Balanced modulator.(BM025 may be used).
7. To detect AM-SB by using SSB detector. (SL 640C may be used).
8. To identifying different stages of radio receiver and IC used at each stage and plot the sensitivity characteristics of a radio receiver and determination of the frequency for maximum sensitivity.
9. To plot the selectivity characteristics of a radio receiver.
10. To plot the fidelity characteristics of a radio receiver.
11. (a) To plot the radiation pattern of directional and Omni directional antenna.
    (b) To plot the variation of field strength of radiated wave, with distance from a transmitting antenna.
12. Tuning and alignement of radio receiver.
13. Circuit tracing and fault finding of different stages of radio receiver.
14. Simple demonstration, ASK, FSK and PSK through training kits

NOTE :- Antenna simulator developed by TTTI can be used for this experiment.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
II Year IV Semester

DEC-404 PRINCIPLE OF DIGITAL ELECTRONICS

1. INTRODUCTION TO DIGITAL ELECTRONICS:

1.1 Basic difference between analog and digital signal.
1.2 Application and advantages of digital signal processing.

1. NUMBER SYSTEM:

2.1 Binary, Octal and Hexadecimal number system; conversion from decimal octal and hexadecimal to binary and vice-versa.
2.2 Binary addition, substraction, multiplication and division including binary points.
2.3 1's and 2's complements methoof substraction.

2. CODES, CODE CONVERSION AND PARITY:

3.1 The 8421 and excess-3 codes; mention of other populer BCD codes.
3.2 Addition of 8421, BCD coded numbers its limitations and excess-3 coded numbers.
3.3 Gray code, Gray to binary conversion and vice-versa.
3.4 Basic concept of parity, single and double parity and error detection.

4. LOGIC GATES:

4.1 Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates.
4.2 Concept of negative and positive logic.

5. LOGIC SIMPLIFICATIONS

5.1 Boolean algebra, Karnaugh-mapping (upto 4 varibles) and simple application in developing combinational logic circuits.
5.2 Implementation of logic equations with gates.
5.3 Use of NAND and NOR gates as universal gates.

6. LOGIC FAMILIES AND DIGITAL ICS:

6.1 Logic family classification :
(a) Definition of SSI, MSI, LSI, VLSI.
(b) Bipolar Logic, Diode Logic, Transistor Logic Intverter,TTL logic, MOS,CMOS logic, logic ECL
(c) Sub-classification of TTL and MOS logic families.
(d) Characteristics of TTL and MOS Digital gates delay, speed of noise margin, logic levels, power dissipation, FAN-IN, FAN-OUT, power supply requirements and comparison between TTL and MOS ICs.

6.2 Logic Circuits :

(a) Open collector and to temples output circuit operation for a standard TTL, NAND gate.

(b) MOS circuit operation for a standard gate (NOR).

6.3 Tristate Switch : Normally open and normally closed switch.

6.4 Familiarization with commercial digital IC gates, Their number identification and Pin configuration.

7. ARITHMETIC OPERATIONS:

7.1 Design of Exclusive Or, Half adder and Half subtractor.
7.2 Design of Full adder circuits and its operation.
7.3 Design of Full subtractor circuits and its operation.
7.4 Some examples (circuits) of code convertors.

8. ENCODER, DECODERS & DISPLAY DEVICES ASSOCIATED CIRCUITS:

8.1 LED, LCD, seven segment display, basic operation of various commonly used types.
8.2 Four Decoder circuits for 7 segment display.
8.3 Basic decimal to BCD encoder circuits.
8.4 Use of decoders/driver ICs with reference to commercial ICs.
8.5 Basic Multiplexer and Demultiplexer

9. FLIP FLOPS:

9.1 Operation using waveforms and truth tables of following flip flops. RS, T, ST, D, JK, Master/Slave JK Flip Flops mention of commonly used ICs Flip flops.

10. COUNTERS:

10.1 Counters classification.
10.2 Binary and decade counters.
10.3 Divide by N counters.
10.4 Programmable asynchronous counters.
10.5 Down counters up/down counter operations.
10.6 Presettable asynchronous counters.
10.7 Difference between asynchronous and synchronous counters.
10.8 Ring counters with timing diagram.
10.9 Familiarization with commerical TTL/CMOS counter ICs.

11. SHIFT REGISTERS:

11.1 Introduction and Basic concepts including shift left and shift right.
11.2 Serial in serial out.
Serial in parallel out.
Parallel in serial out.
Parallel in parallel out.
11.3 Universal shift register.
11.4 Familiarisation with common TTL/CMOS ICs.
11.5 Buffer register, Tristate Buffer Register.

12. MEMORIES:

12.1 Classification according to the following heads.
(a) Volatile and non-volatile memories.
(b) Random access memories and sequential access.
(c) Semiconductor and non-semiconductor memories.
(d) Destructive and non-destructive memories.
12.2 Semi-conductor ROMs, PROMs, EPROM, SRAM, DRAM, Basic structure and working of CCD, R/W memory.

13. A/D AND D/A CONVERTERS:

13.1 Use of A/D and D/A converters.
13.2 Binary resister network R-2R network.
13.3 D/A converter using R-2R.
13.4 UP, UP/Down counter type A/D converter.
13.5 Successive approximation.
13.6 Basic concepts of parrallel A/D converter.
13.7 Two bit A/D converter.

14. ARITHMETIC CIRCUITS:
Ideas About
14.1 Basic Arithmetic logic units applications.
14.2 Block diagram explanation of binary multiplier circuit.

DEC-404 PRINCIPLE OF DIGITAL ELECTRONICS-LAB

LIST OF EXPERIMENTS

1. Do atleast 20 experiments familiarzation with bread-board. Familiarzation with TTL And MOS ICs.
2. Identification of Ic-nos, Pin-nos, Ic types.
3. To observe that logic low and logic high do not have same voltage value in input and output of logic gate.
4. To observe the propagation delay of TTL logic gate.
5. Observation of the difference between MOS and TTL gates under the following heads
   (a) Logic levels.
   (b) Operating voltages.
   (c) Propagation delay.

Display Devices And Associated Circuits.

6. Familiarisation and use different types of LEDs common anode and common cathode seven segment display.
7. Use of 7447 BCD to 7-segment decoder.

Logic Gates.

8. Verification of truth table for 2 Input NOT, AND, OR, NAND, NOR, XOR Gates. Design and Implementation of Simple Logic Circuits.
9. To construct a 4-bit even/odd parity generator/checker using XOR gates and to verify their truth tables.

10. To construct half adder and half subtractor using XOR and NAND gates verification of their truth tables.
11. To construct a full adder circuit with XOR and NAND gates.
12. (a) Study of 3 bit adder circuit implemented with or and NAND gates.
    (b) To construct 4 bit adder and full subtractor using full adder chip 7480 and NAND gates.
13. (a) To verify the truth table of 4 bit adder IC chip 7483.
    (b) To construct the 4 bit adder/2's complement subtractor using 748 and NAND gates.

Flip Flops.

14. To verify the truth table for selected positive edge triggered and negative edge triggered F/F of J-K and D type.

Counters

15. To construct and verify truth table for asynchronous binary and decade using J-K flip flops.
16. (a) To construct divice by 60 counter using ripple.
    (b) To use counter IC chip 7493 in the divide by eight mode and divide by sixteen mode.
    (c) To construct a divide by 100 counter using CMOS.
17. To construct a divide by 60 counters using synchronous counter IC chips.

Registers

18. To construct a 4 bit buffer register using 4 bit register IC chip.
19. To construct a 4 bit universal shift register using flip flops.
20. To use a 4035 B universal shift register.

Multiplexers and Demultiplexers.

21. To decode a 3 line to 8 line encode from 8 line to 3 line and to observe inputs and outputs.
22. Single plus to 16 line decoder and observation output after a 16 to 4 line encoder.
23. To use ALU chip for selected arithmatic and logic operatio

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year V Semester

501 INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT

1. **Principles of Management**

1.1 Management, Different Functions: Planning, Organising, Leading, Controlling.

1.2 Organizational Structure, Types, Functions of different departments.

1.3 Motivation: Factors, characteristics, methods of improving motivation, incentives, pay, promotion, rewards, job satisfaction, job enrichment.

1.4 Need for leadership, Functions of a leader, Factors for accomplishing effective leadership, Manager as a leader, promoting team work.

2. **Human Resource Development**

2.1 Introduction, objectives and functions of human resource development (HRD) department.

2.2 Recruitment, methods of selection, training strategies and career development.

2.3 Responsibilities of human resource management – policies and functions, selection – Mode of selection – Procedure – training of workers, Job evaluation and Merit rating.

3. **Wages and Incentives**

3.1 Definition and factors affecting wages, methods of wage payment.

3.2 Wage incentive – type of incentive, difference in wage, incentive and bonus; incentives of supervisor.

3.3 Job evaluation and merit rating.

4. **Human and Industrial Relations**

4.1 Industrial relations and disputes.

4.2 Relations with subordinates, peers and superiors.

4.3 Characteristics of group behaviour and trade unionism.

4.4 Mob psychology.

4.5 Grievance, Handling of grievances.

4.6 Agitations, strikes, Lockouts, Picketing and Gherao.

4.7 Labour welfare schemes.

4.8 Workers' participation in management.

5. **Professional Ethics**

5.1 Concept of professional ethics.

5.2 Need for code of professional ethics.

5.3 Professional bodies and their role.

6. **Sales and Marketing management**

6.1 Functions and duties of sales department.

6.2 Sales forecasting, sales promotion, advertisement and after sale services.

6.3 Concept of marketing.

6.4 Problems of marketing.

6.5 Pricing policy, break even analysis.

6.6 Distribution channels and methods of marketing.

7. **Labour Legislation Act (as amended on date)**

7.1 Factory Act 1948.

7.2 Workmen's Compensation Act 1923.

7.3 Apprentices Act 1961.

7.4 PF Act, ESI Act.

7.5 Industrial Dispute Act 1947.

7.6 Employers State Insurance Act 1948.

7.7 Payment of Wages Act, 1936.

7.8 Intellectual Property Rights Act

8. **Material Management**

8.1 Inventory control models.

8.2 ABC Analysis, Safety stock, Economic ordering quantity.

8.3 Stores equipment, Stores records, purchasing procedures, Bin card, Cardex.

8.4 Material handling techniques.

9. **Financial Management**

9.1 Importance of ledger and cash book.

9.2 Profit and loss Account, Balance sheet.

9.3 Interpretation of Statements, Project financing, Project appraisal, return on investments.

10. **Entrepreneurship Development**

10.1 Concept of entrepreneur and need of entrepreneurship in the context of prevailing employment conditions.

10.2 Distinction between an entrepreneur and a manager.

10.3 Project identification and selection.

10.4 Project formulation.

10.5 Project appraisal.

10.6 Facilities and incentives to an entrepreneur.

11. **Fundamental of Economics**

11.1 Micro economics.

11.2 Macroeconomics.

12. **Accidents and Safety**

12.1 Classification of accidents based on nature of injuries, event and place.

12.2 Causes and effects of accidents.

12.3 Accident-prone workers.

12.4 Action to be taken in case of accidents with machines, electric shock, fires and erection and construction accidents.

12.5 Safety consciousness and publicity.

12.6 Safety procedures.

12.7 Safety measures – Do's and Don'ts and god housing keeping.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year V Semester

DEC- 502 ELECTRONIC INSTRUMENTS & MEASUREMENTS

1. INTRODUCTION TO THE PROCESS OF MEASUREMENTS:

1.1 Review of the terms, accuracy, precision, sensitivity range and errors, difference between accuracy, precision and resolution.

1.2 Precaution against high frequency noise pick up and remedies, shielding and grounding (two terminal and three terminals).

1.3 Concept of selective wide band measurements.

2. MULTIMETERS:

2.1 Principle of measurement of D.C. voltage and D.C. current, A.C. voltage and A.C. current and resistance in a multimeter.

2.2 Specifications of a multimeter and their significance.

2.3 Limitations with regards to frequency and impedance.

3. ELECTRONIC MULTIMETER:

3.1 Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity, principles of voltage, current and resistance measurements.

3.2 Specification of electronic multimeter and their significance.

4. A. C. MILLIVOLTMETER:

4.1 Types of AC millivoltmeters: Amplifier-rectifier and rectifier amplifier, block diagram and explanation of the above types of A.C. milli voltmeter.

4.2 Typical specifications and their significance.

5. CATHODE RAY OSCILLOSCOPE:

5.1 Construction of CRT, Electron gun, Electrostatic focusing and acceleration (Explanation only-no mathematical treatment) Deflection sensitivity, Brief mention of screen phosphor for CRT. Internal Block Diagram of CRO.

5.2 Explanation of time base operation and need for blanking during flyback, synchronisation.

5.3 Block diagram and explanation of a basic CRO and a triggered sweep oscilloscope, front panel controls.

5.4 Specifications of CRO and their significance.

5.5 Use of CRO for the measurement of voltage (D.C. & A.C.) frequency using Lissagious figure, time period, phase.

5.6 Special features of dual trace, delayed sweep and storage CROs (Brief mention only).

5.7 CRO probes including current probes.

5.8 Working Principle of Spectrum Analyzer.

6. AUDIO POWER METER:

6.1 Block diagram of an audio power meter.

6.2 Principles of working its application and high frequency limitations.

6.3 Scale conversion from power to db.

7. SIGNAL GENERATORS:

7.1 Block diagram explanation of laboratory type low frequency and RF signal generators, pulse generator and function generator.

7.2 Specification for low frequency signal generator, RF generator,pulse generator and function generator. Brief idea of testing specification for the above instrumets.
7.3 Standard signal generator.

8. IMPEDANCE BRIDGES Q METERS:

8.1 D.C. and A.C. Bridges :

D.C. bridges- Wheat stone bridge, Kelvins bridges, Senstivity- Null indicators.

A. C. Bridges - Inductance bridges (Maxwell bridge), Capacitance bridges, Hays bridge, Anderson bridge, Schering bridge, Wein bridge, Twin betwork, Storage factor, Dissipation factor and their measurments.

8.2 Block diagram explanation and working principle of laboratory types (balancing type) RLC bridge. Specifications of a RLC bridge, Principle of digital RLC bridge.
8.2 Block diagram and working principles of a Q meter.

9. REGULATED POWER SUPPLY:

9.1 Block diagram of regulated power supply, IC based power supply.
9.2 Major specifications of regulated power supply, & their measurement (line and load regulation, output ripple and transients).
9.3 Basic working principles of switched mode power supply.
9.4 Concept of floating and grounded power supplies and their interconnections to obtain multipple output supplies.
9.5 Basic working principle of uninterupted power supply

10. DIGITAL INSTRUMENTS:

10.1 Comparison of Analog and Digital instruments, characteristics of digital meter.
10.2 Working principle of Ramp, Dual slope and integrating type of digital voltmeter.
10.3 Block diagram and working of a digital multimeter.

ELECTRONIC INSTRUMENTS AND MEASUREMENT LAB

LIST OF PRACTICALS

1. Loading effect of a multimeter and its limitations to measure high frequency voltages.
2. Measurement of Q of a coil and its dependence on frequency using a Q meter.
3. Measurement of voltage, frequency, time period, phase angle and delay time using CRO : (use of Lissagious Figures).
4. Measurement of time period, frequency, average period using universal counter frequency counter.
5. To test a power supply for ripple, line and load regulation, Tracing of wave form, To findout operating range of power supply.
6. Measurement of rise, fall and delay time using a CRO.
7. Measurement of distortion of a LF signal generator using distortion factor meter.
8. Measurement of R.L. and C using a LRC bridge/universal bridge.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year V Semester
DEC-503 AUDIO AND VIDEO ENGINEERING

1. ELECTRO ACOUSTIC TRANSDUCERS:

1.1 Microphones-carbon, condenser, moving coil, crystal, ribbon and lavaliere microphones, their construction and basic working principles, frequency response, impedance, sensitivity & directional patterns, typical applications of different types of microphones. Idea of other commerical microphones.

1.2 Loudspeakers-direct radiating and horn loader type their construction, working principles characteristics and applications. Baffles and Enclosures. Introduction to tweeters and woofers and crossover networks, Speakers column.

2. SOUND RECORDING:

Magnatic Recording :

2.1 Basic Idea about Sound Recording on Magnetic Tape and its reproduction.

2.2 Optical Recording of Sound : Basic ideas of optical recording of sound on films and its reproduction

2.3 Digital Recording of Sound :Basic ideas of Digital Recording and Reproduction of Sound. Basic concepts of sampling quantization, aliasing and encoding. formats of digital audio recording, basic of recording-Servo system. Material and formation of CD, Black diagram of audio CD player. Description of its main block.

3. HI-FI STEREO AND ITS SYSTEM:

3.1 General ideas about public address system and its block diagram.

3.2 Concept of Fidelity, noise and different types of distortions in an audio system. Stereophony, comparison of monophonic and stereophonic sound. Brief description of stereophonic recording on tape. Block diagram of hi-fi stereo system, Function of bass, Treble, Loudness and Balance control. Consequences of mismatach between amplifier output and speaker impedance. Need for a multi-speaker column. Cross over network in speaker columns.

4.A. INTRODUCTION TO TV COMMUNICATION:

4.1 Elements of telecast TV chain giving elementary idea of the role of TV camera, TV transmitter, propagation of signal, reception through antennas, TV receiver.

4.2 Brief mention of other types of TV communication such as CCTV, CATV, MATV, Sattelite TV and their applications.

4.3 Brief mention of factors affecting range of TV coverage such as:-

(a) Line of sight propagation.
(b) Effect of earth's curvature.
(c) Receiving and transmitting antenna heights.
(d) Power of transmitter.

4.B. **PRINCIPLES OF SCANNING AND FORMATION OF COMPOSITE VIDEO SIGNALS:**

4.1 Basic of photoelectric conversion from scene to electrical signal through camera tube.
4.2 Sequential and interlaced scanning, line frequency field frequency.
4.3 Concept of :-
(a) Field and Frame.
(b) Persistance of vision and flicker.
(c) Picture element.
(d) Aspects ratio.
4.4 Frequency range of various bands and channels in the VHF range used in India.
4.5 Channel specifications :
4.5.1 Channel frequency limits, vision and sound carrier frequencies.
4.5.2 Need for VSB and VSB specifications.
4.5.3 Vision bandwidth, vision modulation types, sound bandwidth, sound modulation type, reasons for employing AM for vision FM for sound and negative modulation for TV transmission, Composite Video Signal.

5. CAMERA TUBES:

Basic concepts of Signal tube colour camera, its construction and working

6. PICTURE TUBE:

6.1 Basic principle of operation and working B and W picture tube, its mounting and adjustment of Yoke.
6.2 Brief idea about delta gun and guns in line picture tube.
6.3 Construction and working of single gun(Trinitron) picture tube

7. FUNDAMENTAL OF COLOUR SIGNAL:

7.1 Basic idea about primary and complementry colour (Why, Red, Blue and Green are used as primary colour).
7.2 Production of Luminuance and colour difference signal.

8. COLOUR CAMERA:

8.1 Digital colour camera system. Basic idea of construction and working.
8.2 Solid state imagers.

9. NTSC & PAL FUNDAMENTALS:

9.1 Basic principles of NTSC & PAL system.
9.2 Basic principle of QAM (Qudratur Amplitude Modulation)
9.3 Basic principle of PAL-S, PAL-D and Synchronous demodulation
9.4 Block diagram of NTSC and PAL coder and decoder, function of each block

10. VIDEO DISPLAY UNITS (VDU):

10.1 Block diagram and specifications of colour VDU and function of each block.
10.2 Interfacing of VDU with computers.
10.3 Basic idea about LCD/Plasma/LED monitor
10.4 Remote controlling of Electronic Devices (Basic Idea).
10.5 Basic Idea of construction and working of HDTV.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year V Semester

AUDIO AND VIDEO ENGINEERING LAB

LIST OF PRACTICALS

1. Study of different features and Measurement of directivity of various types of microphones and loudspeakers. (Approximate).

2. Frequency response of crossover networks in speaker columns.

3. Installation and operations of PA system. (Preferably in auditorium).

4. To study the operation and control of DVD player and identification of main stages and components.

5. Familiarisation with the physical layout, location of stages (transistors, ICs), major components, measurement of D.C. voltage & tracing of signal in Colour TV receiver. The student should be required to identify components from circuit diagram with physical layout of corresponding parts and marks hazardous areas.

6. Familiarisation with all controls and efects of adjustments of controls on the performance of a Colour TV receiver.

7. Fault finding in each stage of a TV receiver.

8. To study the installation process of DTH system.

NOTE:-

1. A demonstration model of a Colour TV receiver should be developed in the lab itself to perform the above related exeriments.

2. Visit to the nearest TV studio and transmitter is necessary for idea of digital video communication.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year V Semester

DEC- 504 OPTICAL FIBER ENGINEERING

1. FUNDAMENTAL OF OPTICS :

1. Nature of Light :
1.1 Electromagnetic nature of light.
1.2 Principle of reflection, refractions, polarization.
1.3 Basic principle of optical communicaiton.

2. Introduciton To Optical Fibre :
2.1 Classificaiton of fibre
2.2 Physical structure.
2.3 Electromagnecic mode theory for optical propagation - Electromegnetic waves, Modes in planar guide, Modes in cylinderical fiber phase and group velocity.

2. OPTICAL DEVICE :

1. Optical Sources :
1.1 Direct and indirect band gap semiconductors.
1.2 Internal and external quantum efficiency.
1.3 Principle, characteritics and construction of LED.
1.4 Semiconductor Lasers - Laser action, PN junction laser, Febry- Perot resonators.

2. Detectors :
2.1 Introduction
2.2 Photodiode- Material and types.
2.3 Avalanche Photo Diode (APD), PIN diode.
2.4 Temperature effect on avalanche gain, noice in APD.
2.5 Photo transistor, PIN-FET, Photo darlingtion.
2.6 Response time, BW, Noise equivalent power, responsivity.
2.7 Spectral response, dark current and quantum efficiency.

3. CONNECTORS, SPLICERS AND SPLITTERS :

3.1 Need of connectors.
3.2 Types cof connectors.
3.3 Single and multimode fiber connectors.
3.4 Need and splicing.
3.5 Types of splicing. Optical Fibre Budget.
3.6 Different splicing techniques.
3.7 Splitters.

4. COUPLERS AND CABLE

4.1 Need and types of couplers.
4.2 Source of fiber couplers, Fiber to Fiber couplers, Fiber to detector couplers.
4.3 Entrinsic and Extrinsic coupling loss.
4.4 Reasens and types - Under ground, Under sea and over head.
4.5 Elements of cable structure and its characteristics.
4.6 Cable installation and design consideration.
4.7 Cable jacketing, cable lying, Transport and handling.

3. OPTICAL MEASUREMENT:

3.1 Introduction.
3.2 Transmission loss measurements - Fiber attenuation, Fiber abserption loss measurement, Fiber scattering loss measurement.
3.3 Fiber despersion measurements - Time Domain and Frequency Domain measurements.
3.4 Finer cut off wave length, Fiber numerical aperture measurements.
3.5 Optical Power Budget.

4. OPTICAL COMMUNICATION :

4.1 Introduction of light wave.
4.2 Types of modulation, ON-OFF modulaiton
4.3 Anlog and Digital transmission.
4.4 Audio Video and Data transmission.
4.5 Computer communication using RS 232 Port.
4.6 Coherent System.

OPTICAL FIBER ENGINEERING

LIST OF PRACTICAL

1. Study of reflection of light.
2. Study of LED characteristics.
3. Study of Laser characteristics
4. Study of Optical detector characteristics
5. Study of different connectors.
6. Study of different splicers.
7. Study of different couplers and splitters.
8. Measurement of connectors loss.
9. Measurement of splice loss.
10. Measurement of coupling loss.
11. Study of dispersion loss in Fiber.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year VI Semester

DEC- 601 ENVIRONMENTAL EDUCATION & DISASTER MANAGEMENT

1. INTRODUCTION:

- Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on Ecology and eco system, different development i.e. irrigation, urbanization, road Development and other engineering activities and their effects on Ecology and eco system, Mining and deforestation and their effects.
- Lowering of water level, Urbanization.
- Biodegradation and Biodegradability, composting, bio remediation, Microbes.Use of biopesticidies and biofungicides.
- Global warning concerns, Ozone layer depletion, Greenhouse Effect, Acid Rain, etc.

2. POLLUTION:

Sources of pollution, natural and manmade, their effects on living environments and related legislation.

2.1 WATER POLLUTION:

- Factors contributing water pollution and their effect.
- Domestic waste water and industrial waste water. Heavy metals, microbes and Leaching metal.
- Physical, Chemical and Biological Characteristics of waste water.
- Indian Standards for quality of drinking water.
- Indian Standards for quality of treated waste water.
- Treatment methods of effluent (domestic waste water and industrial/ Mining Wastewater), its reuse/safe disposal.

2.2 AIR POLLUTION:

Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, GO, CO2, NH3, F, CL, causes and its effects on the environment.

- Monitoring and control of air pollutants, Control measures techniques.
  Introductory Idea of control equipment in industries i.e.
  A. Settling chambers
  B. Cyclones
  C. Scrubbers (Dry and Wet)
  D. Multi Clones
  E. Electro Static Precipitations
  F. Bog Fillers.
- Ambient air quality measurement and their standards.
- Process and domestic emission control
- Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV.

2.3 NOISE POLLUTION:

Sources of noise pollution, its effect and control.

2.4 RADISACTIVE POLLUTION:

Sources and its effect on human, animal, plant and material, means to control and Preventive measures.

2.5 SOLID WASTE MANAGEMENT:

Municipal solid waste, biomedical waste, Industrial and Hazardous waste, Plastic Waste and its management.

3. LEGISLATION:

Preliminary knowledge of the following Acts and rules made there under-

- The Water (Prevention and Control of Pollution) Act - 1974.
- The Air (Prevention and Control of Pollution) Act - 1981.
- The Environmental Protection (Prevention and Control of Pollution) Act -1986.

Rules notified under EPAct - 1986 Viz.

The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000
The Hazardous Wastes (Management and Handling) Amendment Rules, 2003
Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003.
The Noise Pollution (Regulation and Control) (Amendment) Rules, 2002.
Municipal Solid Wastes (Management and Handling) Rules, 2000.
The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.

4. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) :

- Basic concepts, objective and methodology of EIA.
- Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction).

5. DISASTER MANAGEMENT:

Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and Benefit of vulnerability reduction, Factor promoting vulnerability reduction and Mitigation, Emergency support function plan. Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year VI Semester

DEC-602 MICROPROCESSORS AND APPLICATIONS

1. OVERVIEW OF MICROCOMPUTERS SYSTEM:

1.1 Functional block.
(a) CPU. (b) Memory. (c) Input/Out devices (Key board, Floppy drive, Hard disk drive, Tape drive, VDU, Printer, Plotter).

1.2 Concept of programme and data memory.
(a) Registors (general purpose). (b) external memory for storing data and results.

1.3 Data transfer between registers.

1.4 Concept of tristate bus.

1.5 Control on registers.

2. INTRODUCTION OF 8085 MICROPROCESSOR:

Evolution of Microprocessor, Register Structure, ALU, BUS organization, Timing and Control. Internal Architecture of 8085 microprocessor, Pin diagram and input output (in detail)

3. INTRODUCTION OF 8086 MICROPROCESSOR:

Internal organization of 8086, Bus Interface Unit, Execuation Unit, Unit, register, Organization, Sequential Memory Organization, Bus Cycle.

4. ASSEMBLY LANGUAGE PROGRAMMING:

Addressing Modes, Data Transfer, Instructions, Arithmetic & Logic Instruction, Program Control Instructions (Jumps, Conditional Jumps, Subroutine Call) Loop and String Instructions, Assembler Directives.

5. BASIC I/O INTERFACING :

Programmed I/O, Interrupt Driven I/O, DMA, Parallel I/O (8255-PPI, Centronics Parallel Port), Serial I/O (8251/8250, RS-232 Standard), 8259-Programmable Interrupt Controller, 8237-DMA Controller, 8253/8254-Programmable Timer/Counter, A/D and D/A conversion.

6. MEMORY INTERFACING :

Types of Memory, RAM and ROM Interfacing with Timing Considerations, DRAM Interfacing. Memory organization, Extension of memory in word length and depth, Memory mapping, Bus contencion and How to avoid it.

7. ADVANCE MICROPROCESSOR AND MICRO CONTROLLERS :

Brief idea of Microcontroller 8051, Pentium and Power PC

NOTE : Study of Popular ICs Read/Write Chips-8155/8156, 2114, 2148, 2164. ROM Chips- 8355,2716,2732,8755. Other support chips - 8279,8257,8275,8205.

DEC-602 MICROPROCESSORS AND APPLICATIONS LAB

LIST OF PRACTICALS

1. Assembly language programming :- Programming of simple problems. Assembly Language Programming using addition, substraction, multipication, division, larger, largest, smaller, smallest, postive and negative, etc. 8 bit and 16 bit based programming

2. Simple programming problems using 8085 and 8086 microprocessor. Trainer kit to gain competence in the use of
   (a) 8085 and 8086 Instruction set.
   (b) Support chips of 8085 and 8086.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year VI Semester

DEC- 603 MODERN COMMUNICATION SYSTEMS

1. INTRODUCTION TO COMMUNICATION SYSTEM: Basic idea of telegraphy, telephonic, digital, microwave, fibre optics, sttellite, mobile and data communication. Features of Microwave communication system, Block diagram, Antenna types.

2. TELEGRAPHY AND TELEPHONY:

A. Facsimile transmission- Elementary idea of Fax machine and its operation, Transmission and Receiving process

B. Telephone component- Construction and working of transmitter and receiver components, parts, curcuit and working of subscriber's push button telephone sets.

C. Brief idea of Automatic Exchanges

D. Brief Idea of Electronic Exchanges and PCO.

3. DIGITAL SWITCHING SYSTEM:

Salient feature, architecture and services of C-DOT 128, C- DOT 256, C-DOT 512, EWSD (Electronic Digital Switching Network, OCB-283.

4. DIGITAL COMMUNICATION:

4.1 Elements of Digital Communication and information theory : Model of a digital communication system, Logarithmic measure of information. Source coding fixed in and variable length code words. Hartely-Shannon law for channel.

4.2 Sampling Theory and Pulse Modualtion : Sampling theorem, Signal reconstruction in time domain. Types of analog pulse modulation, Method of generation and detection of PWM, PNM and PPM.

4.3 Waveform Coding Technique : Quantization, Quantization noise, Encoding and Pulse code modulation, Differential pulse code modulation, Delta modulation, Comparison of PCM and DM.

4.4 Digital Multiplexing : Fundamentals of time division multiplwxing electronic commutator.
4.5 Digital Modulation Techniques : Types of digital modulation, Wave forms for amplitude, Frequency and phase shift keying, Method of generation and detection of coherent and non-coherent binary ASK,FSK & PSK, Differential phase shift, Quadrature modulation techniques. (QPSK and MSK) Probability of error and comparision of various digital modulation techniques.
4.6 Error Control Coading : Error free communication over a noisy channel, Hamming sphere, Hamming distance and Hamming bound, Relation between minimum distance and error detecting and correcting capability.

5. SATELLITE COMMUNICATION:

(i) Introduction, historical background and basic Concepts of satellite communication. Elements of satellite communication link.
(ii) Geostationary orbits, Orbit mechanisms and lauching of satellte
(iii)Satellite space craft- Satellite sub system, Tracking and Command, Communication subsystem, Transponders, Space Craft antena
(iv) Satellite Channel and Link Design : Degin of down links and uplinks
(v) Earth stations technology: Earth Station Design, Earth Station Tracking, Low noise amplifiers.
(vi) Multiple access techniques :Frequency Division Multiple Access (FDMA), FDM/FM/FMFDMA, Time division, Multiple Access, Frame Structure and Synchronization, Code division, Multiple Access, random Access.
(vii) Introduction to DTH system

6. MOBILE COMMUNICATION:

Evaluation of mobile communication, A simplified reference model for mobile communications. A brief introduction of frequency for radio transmission,signals, propagation, Multiplexing, Modulation, Spread spectrum, Cellular system. Medium Access Control : Introduction To MAC, Advance Mobile Phone. Introduction to GSM (Global System For Mobile Communication), GPRS,GPS, Enable Positioning System. System Architecture, Protocol Architecture, Physical Layer and MAC layer. Mobile Networks

7. DATA COMMUNICATION :

1. Data Transmission Basics : Review of digital data anlog modulation and digital formats. Data rates, Baud Rates, Channel capacity, Mediums for communication, Synchronous and asynchronous data communication.
2. ISO-OSI model and TCP/IP model of network, Protocols and serices. Connection oriented and connectionless services, their interpretation at different layers. Quality of services, Design issue for different layers.
3. Data Links Layer Design Issues : Services provided to network layer froming: Necessity and techniques. Error control feature and review of techniques.
4. IEEE 802 standards for computer networks.
5. Brief idea of network layer, transport layer.
6. Internet and ISDN services.
7. 3G Technology, YMax Technology, LTE, FTTL, Antenna used in mobile communication, Mobile Handset, IME number, SIM, IPB-4 and IPB-6, Router, Switch, LAN, WAN

DEC- 603 MODERN COMMUNICATION SYSTEMS LAB

LIST OF PRACTICALS

1. Study of FAX machines and its working.
2. To study the parts of telephone hand set:
   (a) Frequency response of telephone receiver.
   (b) To observe the wave form of impulses by dialling a number.
3. Visit and study of Digital Switching System.
4. Visit and study of Satellite transmission system.
5. Demonstration of sampling, FSk and PSK by simple experiment.
6. Demonstration of optical fibre communication through simple kits.
7. Study of working of mobile phones and its services.
8. Study and use of ISDN and Internet services.
9. Testing and fault finding of mobile phone and its service.
10. Visit and study of celluler base station.
11. Study of DTH system

NOTE: Report of every visit has to be submitted by each student along with the practical record to be examined by the examiner.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year VI Semester

DEC- 604 MICROWAVE & RADAR ENGINEERING

1. E.M. WAVE THEORY:

1.1 Boundary Condition and different forms of Maxwell Eqution
1.2 Concept of polarization of EM waves.
1.3 Concept of the electromagnetic radiation and propagation.

2. ANTENNA :

A study of Microwave antena

3. MICROWAVE:

3.1 Introduction to microwave and its applications, classification on the basis of its frequency band according ITU standards.
3.2 Effects of interelectrode capacitance, lead inductance and transit time on the signal frequency performance of conventional operations.
3.3 Construction, Operating Principles, Performance characteristics and Applications of the following -

(a) Microwave Tubes- Multi-cavity Klystron, Multi-cavity Magnetron, Reflex Klystron, Travelling wave tube and BWO.
(b) Microwave Semiconductor Devides - PIN, Tunnel Diode, IMPATT and TRAPATT and Gun diode .

3.4 Different types of waveguides and their applications. Propagation constant of a rectangular waveguide, cut off wavelength, guide wavelength. (No Mathematical Derivation)
3.5 Microwave components-Tees, Bends, Matched termination, Detector mount, Slotted section, directional coupler, Circulator & duplexar-their constructional features characteristics and application.
3.6 Microwave antennas-horn and parabolic disk antennas-their characteristics and typical applications.
3.7 Block diagram and working principles of microwave systems.
3.8 Microwave power measurements thermal convertors.
3.9 Planning of microwave links-Line of sight, fresnel zones reflecting surfaces and fade margin.
3.10 Troposcatter links-Basic idea only.

4. RADAR SYSTEMS:

4.1 Introduction to Radar, its various application. Radar range equation (No Derivation) and its application.
4.2 Block diagram and operating principle of basic pulse radar, concept of ambiguous range.
4.3 Block diagram, operating principle of CW (Doppler) and FMCW radars and their application.
4.4 Block diagram and operating principle of MTI radar.
4.5 Radar display-PPI

5. RADIO AIDS TO NAVIGATION:

5.1 Application of loop antenna in direction finding, Errors adock antenna.
5.2 Description of different navigational system-VHF omnirange (VCR). Distance measuring equipment (DME), Long Rang Navigational (LORAN), Instrument Landing System (ILS) and Ground Control Approach.

6. SATELLITE COMMUNICATION:

6.1 Basic idea passive and active satellites.
6.2 Meaning of the terms Orbit, Aporgee and Perigee.
6.3 Geo-stationary satellite and its need.
6.4 Block diagram and explanation of a satellite communication link.

7. FASCIMILE TRANSMISSION:

7.1 Basic concept.
7.2 Specifications of fascimile transmitter and receiver.
7.3 Block diagram & function of each block.

Department of Electronics Engineering
(Faculty of Engineering & Technology)
P.K. University, Shivpuri (MP)
III Year VI Semester

DEC-605 PROJECT

GENERAL OBJECTIVE:

Purpose of the project work is:
(i) To develop abilities of diagnosing problems.
(ii) To develop the abilities to :
(a) Make literature survey.
(b) Design/develop/frbricate/test simple circuits.
(c) Prepare documents for electronic work.
(d) Work as a team.

LIST OF PROJECTS (TO BE ASSESSED INTERNALLY):

The list of projects shown below is indicative of general nature and the complexity of work to be entrusted to students. (Teachers can modify this list to shut local needs and contraints keeping the level of complexity as suggested here).

1. To make simple circuit which will demonstrate the use of tranistor as a switch. (The student should measure Ic and Vce in this circuit when Ib is varied from zero to a maximum value and measures the value of Ib (sat), Ic (sat), Vce (sat) and Hfe (min) for saturation at a given supply voltage and load.
2. To calculate the values and assemble and test simple transistor switching circuit to switch on a
   (a) LED.
   (b) Relay.
   (c) 200/500 ma. lamp. (6v/12v).
3. Make a battery eliminator
4. Make a battery charger.
5. Fabricate (including making PCB) and testing of regulated power supply (series and shunt circuit using zener diode &IC type).
6. Assembly and testing of a two band transistor radio receiver.
7. Fabrication and testing of any ICs of consumer interest, For example.
   (a) Fan regulater/Light dimmer.
   (b) Timer using IC 555.
   (c) Burglar's alarm.
   (d) Digital clock.

   The list is only suggestive, more items may be included

LIST OF PROJECTS

NOTE: The list of projects shown below is to be used as a guideline by the BTE(UP) for drawing up the project list for the diploma examination. Expert team formulating the final list may consult this list to ensure that the complexity level is consistent with the guideline set here.

1. AMPLIFIERS:

1.1 Simple transistor / FET / IC amplifer to meet the given specifications.
1.2 Audio frequency mono/stereo amplifier including usual control facilities (including power amplifier and power supply stages).

2. OSCILLATORS:

2.1 Sine wave oscillators of given specifications using transistors/FETs/ICs (tuned oscillators, phase shift, including Wein's Bridge oscillators).
2.2 Multivibrators of different types to produce square wave output signals of given specifications (Monostable, Bistable and Astable) using transistor FET or IC circuits.
2.3 Simple function generators.

3. POWER SUPPLIES:

3.1 Single dual and multiranged low voltage and low power fixed variable D.C. power supplies of different specifications using transistor and regulator ICs.

4. TIMERS AND OPERATIONAL AMPLIFIERS:

4.1 Timers of different types using 555/556 ICs.
4.2 Amplifiers, oscillators, active filters, differentiations, integrator, scale changer and other simple circuits using operational modules.

5. DIGITAL CIRCUITS:
5.1 Simple three digit counter.
5.2 24 hour and 12 hour digital clock.
5.3 Electronic multimeter.
5.4 A/D and D/A convertors.
5.5 Interface circuits using Microprocessers.

6. MISCELLANEOUS CIRCUITS:
6.1 Fan regulators, motor speed control, phase controlled rectifier and similar circuits using Thyristor/Triac/Diac/UJT and similar PNPN devices.

7. RADIO RECEIVER:
7.1 Simple one or two band AM radio receiver.
7.2 Simple transreceiver.
8. Mobile Phone based devices and Microcontroller based devices.

NOTE:-
1. Depending upon the complexity of the work, the teacher may assign any number of project work to a group. The group size will also be similarly decided by the teacher, normally between 2 to 4 students per group.
2. The board may request all heads of Electronics Engineering Departments of U.P. Polytechnics to provide list of projects. An expert committee may be appointed to screen the project list.
3. The BTE (UP) may adopt the following format for the project report.

FORMAT

A project report (of about 100 typed computer pages) should submitted covering the following points.

1. Basic design procedure for the project circuit.
2. Full block diagram and/or circuits diagram showing the component values.
3. Component layout diagram, including component and copper side details of the PCB used.
4. List of components used showing types voltage/current ratings, tolerance values and other specifications.
5. Details of heatsink used IC and Transistor pin connections and types of packages.
6. Front pannel layout and chassis details. (as relevant)
7. Test and measurement procedure.
8. Discussion on the deviation of the results from the given specifications.
9. Estimating and costing with discussion about selection of components from cost point of view.

NOTE: For specialization Digital Electronics and Microprocessors and Radio, Audio Video Engineering, Mobile Communication more project in these subjects should be given by the teachers.