

RANI DURGA VATI VISHWA VIDYALAYA, JABALPUR
Syllabus Prescribed for the B.Sc.-V & VI Semester
SUBJECT: ELECTRONICS

B.Sc.-V Semester : 2013 Onwards
Power Electronics, Electrical Motors and Advanced Microprocessor

M.M:85+15 CCE

UNIT- I: Power Devices

18 Lectures

Comparative study of Semiconductor power devices: Power Diodes, power Transistors, Unijunction Transistor, silicon Controlled Rectifier, DIAC and TRIAC. Structural Description and working of unijunction Transistors (UJT), Characteristics curve, Use of a UJT as a relaxation Oscillator.

Structural description and working of Silicon Controlled rectifier, Characteristics Curve, Two Transistor analog of SCR, Forward and Reverse Blocking States, Triggering Methods.

UNIT- II: Applications of SCR

18 Lectures

SCR as a Static AC switch, Phase controlled Rectification, Half Wave and Full wave Rectifiers using SCR with resistive, capacitive and inductive load.

Power Inverters using SCR: with and without reactive feedback Choppers: Basic Principle Construction, working and Waveforms of Morgan Choppers.

UNIT- III: Electrical Motors

18 Lectures

Types of motors, Asynchronous Induction motors: Idea of rotating magnetic field, starting and rotating torque, Slip, Equivalent circuit of an induction motor. Synchronous motor: principle of operation. Single phase induction motor, Different circuits to make it self starting Idea of Iron and Copper Losses .

UNIT- IV: Introduction to 16 Bit Microprocessor

18 Lectures

Register Organization of INTEL 8086, architecture, signal description of 8086, Physical Memory Organization, General Bus Operation, I/O addressing Capability, Minimum and Maximum modes.

INSTRUCTION SET: Microprocessor INTEL 8086: Machine Language Instruction Formats, Addressing Modes of 8086, Instruction set of 8086:Data Copy/Transfer Instruction, Arithmetic and Logical Instructions, Branch Instruction, Loop Instructions, Machine Control Instructions, Shift and Rotate Instructions.

UNIT -V: Special Architectural Features and Related Programming

18 Lectures

Introduction to stack, STACK structural of 8086, Interrupts Services routines, Non Maskable Interrupt, Maskable Interrupt, Macros, Procedures, Programming using macros and call procedures.

Reference Book:

1. Power electronics by P.C. Sen.: Publishers: Tata Mc Graw Hill publishing Company New Delhi.
2. An Introduction to Thyristors and Their Applications by M. Ramamurthy: Publishers: affiliated East -West press Pvt. Ltd. New Delhi
3. Power electronics by P.s. Bimbhra: Publishers: Khanna Publishers, Delhi.
4. Advanced Microprocessors and Peripherals by A.K. Ray and K.M. Bhurchandi: Publishers: Tata McGrew Hill Publishing Company Ltd, New Delhi.
5. Electrical Technology by B.L. Theraja: Publishers: S Chand and Company Ltd.
6. Microprocessors and Interfacing by Douglas V. Hall: Publishers: Tata McGrew Hill Publishing Company Ltd. New Delhi.

List of experiment

Note: preferably seven experiments should be done. Any other experiments of similar standard may also be incorporated.

The scheme of examination will as follows:

1. One Experiment of Three Hours Duration.
2. Marks :
Experiment: 25
Sessional : 10
Viva-Voce: 15
Total Marks: 50
1. Study of SCR Characteristics.
2. Study of DIAC and TRIAC Characteristics.
3. Study of UJT Characteristics.
4. Study of UJT as Relaxation Oscillator.
5. Assembly language Programming to performs basic arithmetic Operations using INTEL 8086 Microprocessor.
6. Assembly Language Programming for the Summation of two Data series using INTEL 8086 Microprocessor.
7. Assembly Language Programming for Finding the square of the elements of a series using call Procedure.
8. ALP using Macros.

(any Other Experiments of similar Standard).

A Pandey

B.Sc.-VI Semester : 2013 Onwards

**Subject: Electronics
Communication System**

M.M. 85+15 CCE

UNIT – I: Noise

18 lectures

Noise Thermal Noise, Shot Noise Partition Noise, Low Frequency and transit time noise, Generation and Recombination Noise, Equivalent Noise Resistance, Signal – to- Noise ration, Noise Factor, Noise Temperature.

Radio Wave Propagation

Introduction Propagation in Free Space, Tropospheric Propagation, Ionosphere Propagation, Surface Wave, LF and VLF propagation. ELF Propagation, Ground wave Sky wave and Space wave propagation. Dead zones, Skip Distance, Maximum Usable Frequency Stratification of Ionosphere

UNIT- II: Amplitude Modulation

18 lectures

Modulation: Principle of Modulation, Amplitude Modulation Principle and waveforms, Modulation Index, Derivation for the modulated wave and Modulation Index. Lanier and Square Modulators. Balanced Modulators, signal side band Transmission Advantages, Disadvantages and methods of Generation.

UNIT –III: Angle Modulation

18 lectures

Elements of Frequency and Phase Modulation Frequency spectrum of FM waves Generation of Frequency Modulation: Direct and Indirect Methods, Phase modulation, Varactor Diode and FET circuits Foster Seeloy Discriminator and Ratio Detector.

Pulse Modulation

Pulse Modulation, Pulse Transmission, Pulse Amplitude Modulation, Pulse Position and Pulse Width Modulation, Time Division Multiplexing. Pulse Code Modulation: Block diagram of PCM. Transmitting and receiving system of PCM.

UNIT – IV: Antennas

18 lectures

Antenna Equivalent Circuits, Radiation Fields, Polarization, Isotropic Radiator, Power Gain, Effective area, Half Wave Dipole, Vertical Antenna, Folded Elements, Loop and Terrie core receiving antennas. YAGI Antenna Non –resonant antenna. Driven arrays. Parasitic annays Microwave antenna

Television Engineering

Characteristics of Human Eye, Persistence of vision and Flicker, Scanning Process, Interlaced Scanning, Composite Video signal, Vestigial Sideband Signal, Standard Channel Characteristics, Book diagram of TV Transmitter and Receiver.

UNIT –V: Satellite Communication

4 18 lectures

Satellite Frequency, Orbits, station Keeping, Satellite Attitude, Transmission Path, Path Los, Noise Considerations, Satellite System, Saturation Flux Density, Effective Isotropic radiated Power Multiple Access Methods. Time Division Multiple Access.

Wireless Communication System

Introduction to Cellular Telephony, Cells, Frequency Re-use Principle, Transmission Reception, Handoff, Roaming, Generations of Cellular Telephony: Global System for Mobile Communication (GSM): Introduction, Switching system. Base Station System Operation and Support System. GSM Specifications VSAT

Reference Books :

1. Electronics Communications by Roddy and Coolen Publishers: Prentice Hall of India New Delhi.
2. Monochrome and Colors Television by R.R. Gulati, Publishers. New Age International Publishers, New Delhi.
3. Electronics Communication Systems by George Kennedy: Publishers: Tata McGrew Hill Publication Company, New Delhi
4. Data Communication an Networking by Behrouz A. Forouzan: Publishers: Tata McGrew Hill Publishing Company. New Delhi
5. Hand Book of Electronics. Gupta & Kumar.

List of Practicals

Note: preferably six experiments and project work should be done. Any other experiments of similar standard may also be incorporated.

The scheme of examination will as follows:

1. One Experiment of Three Hours Duration.

Marks :

Experiment: 20

Sessional : 10

Viva: 5

Project Work & Viva : 15 (10+5)

Total Marks: 50

List of practical:

Study of AM. Generation and detection.

Study of frequency modulation.

Study of Pulse Position modulation.

Study of Pulse width modulation.

Study of Pulse code Modulation.

Study of Radio Receiver Measurement.

Study of F.M. using voltage Controlled Oscillation.

Study of electronic regulation D.C. & A.C. Motors.