

"Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR



Department of Electronics

B.Sc Part -II

Semester III &IV, CBCS

| Semester | Paper No | Course Code | Course Title | No. of Credits |
|----------|------------------------|-------------|---|----------------|
| III | Electronics-Paper- III | DSC -1005 C | Electronics Communication and Microprocessor 8085 | 4 |
| IV | Electronics-Paper- IV | DSC -1005 D | Advance Communication and Microcontroller 8051 | 4 |

Syllabus with effect from june, 2019

B.Sc-II Electronics
Electronics-Paper- III
Electronics Communication and Microprocessor 8085
Course Code (DSC -1005 C)

Mark: 80

Teaching Hours 72

Credits 4

Syllabus

Course Outcomes :-

On successful completion of the course, the students will be able to

- co1:- Apply the knowledge of semiconductors to illustrate the functioning of basic electronic devices.
- Co2:- Differentiate different modulators of AM , DSBSC, SSB, VSB and FM
- Co3:- Explain the basics of satellite communication
- Co4:- Use the Satellite system for the benefit of society and to know the different application of satellite communication
- Co5:- Solve basic binary math operations using the microprocessor
- Co6:- Apply knowledge of the microprocessor's internal registers and operations by use of a PC based microprocessor simulator.
- Co7:- Write assembly language programs, assemble into machine a cross assembler utility and download and run their program on the training boards.
- Co8:- Design electrical circuitry to the microprocessor in order to interface the processor to external devices.

Section I: Electronics Communication

| Unit | Contents | Hours Allotted |
|------|---|----------------|
| 1 | Electronic Communication: Introduction to communication- meaning and types, Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base band signals, concept of Noise, signal-to-noise (S/N) ratio. | 12 |
| 2 | Analog Modulation-Demodulation: Need for modulation, Amplitude Modulation (AM) modulation index and frequency spectrum. Generation of AM (using Transistor), Concept of DSB,SSB generation. Amplitude Demodulation (diode detector).Phase Modulation (PM)(concept only), Frequency Modulation (FM), modulation index and frequency spectrum, equivalence between FM | 12 |

| | | |
|----|---|----|
| | and AM. Generation of FM using VCO, FM detector (Slope detector), and Study of Super heterodyne radio receiver. | |
| 3. | Satellite communication: Introduction, Need, Geosynchronous satellite orbits, geostationary satellite, advantages of geostationary satellite. Satellite visibility, transponders (C- Band), path loss, ground station, simplified block diagram of earth station. Uplink and down link. | 12 |

Reference Books:

- Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
- Electronic Communication systems, G. Kennedy, 3rd Edition, 1999, Tata McGraw Hill.
- Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
- Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

Section II: Microprocessor 8085

| Unit | Contents | Hours Allotted |
|------|--|----------------|
| 1 | Microcomputer Organization: Basic components of microcomputer (CPU, Program memory, Data memory, input and output ports, idea of RAM (SDRAM, DRAM) Types of ROM Memory Organization & addressing. Memory Interfacing. Memory Map. | 08 |
| 2 | Architecture of 8085 Microprocessor: Silent features of 8085. Block diagram and Pin description of 8085. Data and address bus, Registers, ALU, Stack pointer, Program counter, Flag register, Clock and reset circuits. Interrupts in 8085. Demultiplexing of AD0-AD7. T-states, Machine cycle, Instruction cycle. Timing diagram of MOV and MVI instructions. | 10 |
| 3. | Instruction Set of 8085 Microprocessor : Instruction set, classification of Instruction Set, Instruction format, Addressing modes of Instructions, Instruction set: Data transfer (including stacks), Arithmetic, logical, branch and control instructions). | 8 |
| 4 | Programming with 8085 Microprocessor: Programs of Addition (8 and 16 bit), Subtraction, Multiplication, Division, Block Transfer and Exchange, Masking, ascending and descending order, Time delay generation using register and register pair, Detection of odd and even numbers. | 10 |

Reference Books:

- Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
- Microprocessors and Interfacing By Douglas V Hall, McGraw Hill (2005)
 - Microprocessor 8085 By V.S. Kore Mahalakshmi Publications
 - Fundamental of Microprocessor and Microcomputers By B. Ram

B.Sc-II Electronics

Electronics-Paper- IV
Electronics Communication and Microprocessor 8085

Course Code (DSC -1005 D)

Mark: 80

Teaching Hours 72

Credits 4

Syllabus

Course Outcomes :-

- C01:- Understand different Analog Pulse Modulation technique like PAM,PWM and PPM.
C02:- Understand different digital modulation technologies like ASK,FSK and BPSK
C03:- Know modern multiple access schemes, the concept of frequency reuse, channel assignment strategies.
C04:- Understand GSM, CDMA concepts, architecture, frame structure, system capacity
C05:- Understand evolution of mobile communication generations 2G, 2.5G, 3G and 4G with their characteristics and limitations.
C06:- Draw and describe architecture of 8051 microcontroller.
C07:- Interface various peripheral devices to the microcontrollers.
C08:- Write assembly language program for microcontrollers.
C09:- Understand Embedded -C language programming for 8051 Microcontroller
C010:- Design microcontroller based system for various applications

Section I: Advance Communication

| Unit | Contents | Hours Allotted |
|------|--|----------------|
| 1 | Analog Pulse Modulation: Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only, | 12 |
| 2 | Digital Pulse Modulation: Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Phase Shift Keying (BPSK and QPSK). | 12 |
| 3. | Mobile Telephony System – Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, Hand-off process, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only). GPS navigation system (qualitative idea only) | 12 |

Reference Books:

- Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
- Electronic Communication systems, G. Kennedy, 3rd Edn., 1999, Tata McGraw Hill.
- Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
- Communication Systems, S. Haykin, 2006, Wiley India

Section II: Microcontroller 8051

| Unit | Contents | Hours Allotted |
|------|---|----------------|
| 1 | Introduction to 8051 microcontroller: Comparison between microprocessor and microcontroller. Silent feature of 8051 family, , Block diagram of 8051, Pin discription of 8051 microcontroller, , RAM structure of 8051, SFR's and GPR's in 8051, PSW register ,Clock and reset circuit, Memory organization ,I/O Ports. | 08 |
| 2 | Instruction Set of 8051: Classification of instruction sets, Addressing modes . Instruction set of 8051: data transfer, arithmetic, Logical, Jump, call, Boolean instructions. | 10 |
| 3 | Timers, Serial port and Interrupts(Assembly)programming of 8051: A. Timer: Timers in 8051, Timer Registers, modes and Programming of timers B. Serial ports: Serial port of 8051, modes, Registers Serial port, Serial port programming. C. Interrupt: Interrupt in 8051, Interrupt registers, Programming with interrupt. | 08 |
| 4 | Interfacing of Devices with 8051: Introduction to embedded C, comparison of C and assembly, Data types in C, SFR accessing , I/O programming, logical operations in C. C language programming: Program to generate square wave on port pin, Interfacing of LED , Opto-coupler, Switch, Relay, DC motor and Stepper motor. | 10 |

Reference Books:

- The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
- Microcontroller 8051 by Ajay Deshmukh.
- The 8051 Microcontroller by Kenneth Ayala

Assessment Structure

➤ Structure of Question Paper

| Question No. | Head | Marks | Total Marks (80) |
|---------------------|--|-------|------------------|
| Section - I | | | |
| 1 | Select correct alternative for the following | 08 | 40 |
| 2 | Attempt any two of the following | 16 | |
| 3 | Attempt any Four of the following | 16 | |
| Section - II | | | |
| 1 | Select correct alternative for the following | 08 | 40 |
| 2 | Attempt any two of the following | 16 | |
| 3 | Attempt any Four of the following | 16 | |

Section - I

Q1) Select correct alternative for the following (One mark each) -----(8 Mark)

- I.
- II.
- III.
- IV.
- V.
- VI.
- VII.
- VIII.

Q2) Attempt any two of the following -----(16 mark)

- I.
- II.
- III.

Q3) Attempt any Four of the following -----(16 mark)

- I.
- II.
- III.
- IV.
- V.
- VI.

Section - II

Q1) Select correct alternative for the following (One mark each) -----(8 Mark)

- I.
- II.
- III.
- IV.
- V.
- VI.
- VII.
- VIII.

Q2) Attempt any two of the following -----(16 mark)

- I.
- II.
- III.

Q3) Attempt any Four of the following -----(16 mark)

- I.
- II.
- III.
- IV.
- V.
- VI.

➤ Internal Evaluation

| Sr.No | Head | Marks | Total Marks |
|-------|----------|-------|-------------|
| 1 | Test- I | 10 | 20 |
| | Test- II | 10 | |