

Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING AND EXAMINATION

B.E. V SEMESTER ELECTRICAL ENGINEERING

S.No.	Board of Studies	Subject Code	Subject	Periods per week			Scheme of Exam Theory / Practical			Total Marks	Credit L+(T+P) /2
				L	T	P	ESE	CT	TA		
1	Electrical Engg.	324511 (24)	Electrical Machine-II	3	2	-	80	20	20	120	4
2	Electrical Engg.	324512 (24)	Electronic Instrumentation	3	1	-	80	20	20	120	4
3	Electrical Engg.	324513 (24)	Analog Electronics	3	1	-	80	20	20	120	4
4	Electrical Engg.	324514 (24)	Control System Engg.	3	2	-	80	20	20	120	4
5	Electrical Engg.	324515 (24)	Computer Systems Architecture	3	-	-	80	20	20	120	3
6	Electrical Engg.	324516 (24)	Analog & Digital Communication	3	1	-	80	20	20	120	4
7	Electrical Engg.	324521 (24)	Electrical Machine-II Lab	-	-	3	40	-	20	60	2
8	Electrical Engg.	324522 (24)	Electronic Instrumentation Lab	-	-	3	40	-	20	60	2
9	Electrical Engg.	324523 (24)	Analog Electronics Lab	-	-	3	40	-	20	60	2
10	Electrical Engg.	324524 (24)	Control System Lab	-	-	3	40	-	20	60	2
11	Humanities etc.	300525 (46)	Personality Development	-	-	2	-	-	20	20	1
12	Electrical Engg.	324526 (24)	*Practical Training Evaluation and Library	-	-	1	-	-	20	20	1
Total				18	7	1	640	120	240	1000	33

L – Lecture, T – Tutorial,
P – Practical, ESE- End Semester Exam , CT- Class Test
 TA – Teacher’s Assessment

*To be completed after IV Sem. and before the commencement of V Sem.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th
Subject: Electrical Machine-II
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.
Code: 324511(24)
Total Tut Periods: 24

UNIT I: Electrical Machines Principles

Principle of electromechanical energy conversion. Construction of various rotating machines. Singly excited magnetic system, co-energy and field energy. Doubly excited magnetic system. Torque expression for reluctance motor MMF of concentrated and distributed windings, EMF equation, winding factors, torque and voltage in salient and non-salient pole machines, coupled circuit and magnetic field view point, rotating magnetic fields, torque production in synchronous, induction and DC machines.

UNIT II: Synchronous Machines I

Theory of non-salient pole synchronous machines, basic synchronous machine models, equivalent circuit and phasor diagrams of synchronous machines, saturation effects, armature reaction, open circuit, short circuit and zero power factor lag tests on synchronous machines, synchronous reactance, SCR, voltage regulation of alternators by synchronous impedance, MMF and zero power factor method, excitation systems of alternators

UNIT III: Synchronous Machines II

Generator input and output, steady state power angle characteristics, parallel operation of synchronous machines, load sharing, operation of synchronous machines with infinite bus bars, synchronizing torque, active and reactive power flows, general load diagram, V-curves.

UNIT IV: Synchronous Machines III

Theory of salient pole synchronous machines, two-reaction theory, phasor diagram, power angle characteristics, determination of X_d and X_q , stiffness of coupling synchronous motors, phasor diagrams, starting of synchronous machines, damper winding.

UNIT V: Polyphase Induction Machines

Cage and slip-ring induction motors, equivalent circuit, phasor diagram, normalized torque-speed (slip) relationship, starting and speed control of induction motors, cogging and crawling, double cage induction motors, testing of induction motors, circle diagram.

Text Books:

1. Electrical Machines by Smarajit Ghosh, Pearson Education
2. Performance & Design of A.C. Machines by M.G. Say, C.B.S. Publishers

Reference Books:

1. Electric Machines by Nagrath & Kothari, TMH Pbs.
2. Electric Machines by P.K. Mukherjee & S.Chakravarti, Dhanpat Rai
3. Electrical machines by B. R, Gupta, New age international.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th

**Branch: Electrical and
Electrical & Electronics**

Subject: Electronic Instrumentation

Code: 324512 (24)

Total Theory Periods: 40

Total Tut Periods: 12

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

UNIT I: Digital electronic instruments

Introduction, specifications of digital meters, resolution, sensitivity, accuracy, average/true root mean square, crest factor, form factor, zero or offset frequency response, input resistance, input bias current. Digital voltmeters, Ramp technique, dual slope integrating type DVM

UNIT II: Transducers

Passive and active electrical transducers: resistive, capacitive, inductive, piezoelectric, photovoltaic, Hall effect transducers, selection of transducers, transducers characteristics, semiconductor photo-diode, photo transistor, frequency generating transducers, pressure inductive transducers, LVDT, differential output transducer, thermistor, strain gauge, measurement of angular and linear velocity using electrical transducers, reluctance pulse pick-ups, AC tachogenerators.

UNIT III: Data acquisition system (DAS) and recorders

Introduction of DAS, objective of DAS, signal conditioning of inputs, single and multi-channel DAS, computer based DAS, sample and hold, multiplexing, D/A, A/D conversion, general description of Data loggers, digital transducers, optical encoders, resistive digital encoders, shaft encoders.

Recorders: introduction, Strip chart recorders, general description of XY recorders, galvanometer type recorders, potentiometric recorders.

UNIT IV: Oscilloscope & Signal Generations

Introduction, Basic Principal, CRT Feature, Block diagram of oscilloscope, simple CRO, Vertical amplifier, horizontal deflecting system Triggered source CRO, typical CRT connection, measurement of Frequency & phase by Lissajous Figures.

Signal generator: Introduction, sine wave generators, audio Frequency and Radio frequency signal generation, Function generators, Sequence & phase generators

UNIT V: Programmable Logic Controllers:

PLC: Introduction of PLC, PLC structure & operations response time, Basic ladder diagram, PLC resistors, Timer & counters, PLC, DC & AC i/ps. Module for PLC, Basic Process of PLC, PLC Hard ware & Configuration PLC hard ware components.

Text Books:

1. Electronic Instrumentation by H S Kalsi.
2. Electronic Instruments and Instrumentation Technology" by M.M.S. Anand, PHI Pbs.

Reference Books:

1. "Electrical Measurement", Kalsi, TMH Pbs.
2. "Transducers And Instrumentation", Murthy, PHI Pbs.
3. "Electronic Instrumentation And Measurement Techniques", Cooper, PHI Pbs.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th

Subject: Analog Electronics

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324513 (24)

Total Tut Periods: 12

UNIT I: Transients at high frequency

The hybrid π common emitter transistor model, hybrid n-conductance, hybrid π -capacitance, CE short circuit gain with resistive load, the gain bandwidth product, emitter follower at high frequency.

UNIT II: Large Scale Analysis

Class-A large signal amplifiers, harmonic distortion, higher order harmonic generation, transformer coupled audio power amplifier, efficiency, push-pull amplifier, class-B amplifiers, and class-AB operation.

UNIT III: Multistage Amplifier

Classification of amplifier, distortion in amplifier frequency, response of an amplifier, low frequency response of RC coupled amplifier, band pass of cascaded stage, high frequency response of two cascaded CE transistor stages, multistage CE amplifier, High frequency response of two cascaded CE transistor stages, Darlington configuration.

UNIT IV: Operational Amplifier

Operational amplifier architecture, basic operational amplifier, inverting operational amplifier, non inverting operational amplifier, differential amplifier, offset error voltage and current, measurement of amplifier parameters, CMRR, slewing rate, basic operational amplifier applications, differential DC bridge amplifier.

UNIT V: Integrated Circuit Fabrication

Overview of IC Technology, unit steps used in IC fabrication, wafer cleaning, photolithography, wet and dry etching, oxidation, diffusion, ion-implantation techniques for deposition of poly-silicon, silicon, silicon nitride and silicon dioxide, metallization and passivation.

Text Books:

1. "*Electronic Circuit Discrete And Integrated*", Belove, PHI Pbs.
2. "*Integrated Electronics*", Millman and Halkias, PHI Pbs.

Reference Books:

1. "*Microelectronics*", Millman, Wiley Pbs.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th

Subject: Control System Engineering

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324514 (24)

Total Tut Periods: 24

UNIT I: Introduction to Control problem

Industrial control examples, transfer function models of mechanical systems, transfer function models of electrical systems, transfer function models of thermal systems, transfer function models of hydraulic systems, systems with dead time, control hardware and their models, electro-pneumatic valves, pneumatic actuators, closed loop systems, block diagram and signal flow graph analysis, transfer function.

UNIT II: Basic Characteristics Of Feedback Control System

Stability, steady state accuracy, transient accuracy, disturbance rejection, insensitivity and robustness, stability concept, relative stability, Routh stability criterion, time response of second order system, steady state errors and error constants, performance specifications in time domain, root locus method of design, controllers and compensators..

UNIT III: Time and Frequency Response Analysis

Root locus technique, Relationship between time domain and frequency response, polar plot, Bode plot, stability in frequency domain, Nyquist plots, Nyquist stability criterion, performance specifications in frequency domain, Nichol's chart, effects of additional zero and additional poles.

UNIT IV: Introduction to design:

Compensator design (Cascade Lag, Cascade Lead, Cascade Lag-Lead) using root locus plots, compensator design (Cascade Lag, Cascade Lead, Cascade Lag-Lead) using Bode plots.

UNIT V: State Variable Analysis

Concept of state, state variable, state variable formulation and their solution, state models for linear continuous time functions, diagonalization of transfer function, solution of state equations, concept of controllability and observability.

Text Books:

1. "Control System: Principles And Design", M. Gopal, TMH Pbs.
2. "Automatic Control System", Kuo, PHI Pbs.

Reference Books:

1. "Modern Control Engineering", Ogata, PHI Pbs.
2. "Modern Control Engineering", Nagrath and Gopal, PHI Pbs.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th
Subject: Computer Systems Architecture
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.
Code: 324515 (24)
Total Tut Periods: Nil

UNIT I

Basic Computing elements of analog computer, time and amplitude scaling simulation of linear simple and simultaneous differential equations and transfer functions, nonlinear function generators.

UNIT II

Requester transfer and Micro- Operations: Register transfer language, Inter – Register transfer, Arithmetic, Logic and shift micro operations, Control functions.
Computer Organization and Design: Instruction, codes computer instructions, Timing and, control Execution of instructions, Input-Output and interrupts, Design of computer.

UNIT III

Central Processor organization: Processor bus organization, ALU, Stack Organization, Instruction formats, Addressing modes, Data transfer and manipulation, Program control, Parallel processor.
Micro program control organization: Control memory, Address sequencing, Microprogram exaple, Microprogram sequencer, & Microinstruction formats.

UNIT IV

Arithmetic Processor Design: Comparison and subtraction, Algorithm for addition, Subtraction, Multiplication, division, Processor Configuration, Design of Control.
Arithmetic algorithms: Arithmetic with signed 2's complement numbers, Multiplication and Division, Floating point arithmetic operations, Decimal Arithmetic Unit and operations

UNIT V

I/O Organization: I/O interfaces, asynchronous data transfer, DMA, Priority interrupt, I/O processor, Multiprocessor system organization.
Memory organization: Various memories – Auxiliary, Associative, Cache, Microcomputer, Virtual ones, and Memory Hierarchy, Memory Management hardware.
Computer software: Assembly language, Assembler, program loops, subroutines, system.

Text Books:

1. Computer System Architecture by M. M. Mano
2. Computer Architecture and Organization, J.P. Hayes Int'1 student edition, McGraw – Hill.

Reference books:

1. Structured computer organization 3rd Edn by A. Stannabaum.
2. Computer Organization by V.C.Hamacher et al McGraw.
3. Introduction of Digital computer Design by V. Rajaraman & T.Radhakrishnman.
4. Analog computation and simulation by V. Rajaraman PHI

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th

Subject: Analog & Digital Communication

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical, Electrical & Electronics

Code: 324516 (24)

Total Tut Periods: 12

UNIT I: Amplitude Modulation

Need of amplitude modulation, Amplitude modulation, power relation. AM wave, generation of AM, balanced modular signal side band technique, suppression of unwanted sideband, side band transmission, demodulation, envelop detector, synchronous detector, noise in amplitude modulation system.

UNIT II: Angle Modulation

Mathematical equation of frequency modulation (FM), frequency spectrum, phase modulation (PM), relationship between PM and FM, pre-emphasis and de-emphasis, adjacent channel interference, comparison of narrow band and wide band FM, noise in angle modulation system, generation of FM, reactance modulator, frequency division multiplexing.

UNIT III: Pulse Modulation System

Pulse width modulation, pulse position modulation (PPM), pulse code modulation, sampling, Quantization of signals, time division multiplexing.

UNIT IV: Digital Modulation Techniques

Introduction, Digital modulation formats, types of digital modulation techniques, Coherent binary modulation techniques, BPSK, Coherent BFSK, Non coherent binary modulation techniques, Non coherent binary ASK, DPSK, QPSK, MSK, comparison of different techniques.

Wave form coding Techniques, Discretisation in time and amplitude, Quantization, PCM, PCM generator, Quantizer, Transmission band width in PCM, PCM receiver, quantization noise/error in PCM, companding in PCM, Delta modulation, Adaptive delta modulation, DPCM, comparison of different DPM methods.

UNIT V Information Theory

Introduction, Sources of information, Contents in DMS, Contents of a symbol, Entropy, Information rate, Discrete memory less channel, Conditional joint entropies, mutual information, Channel capacity, Active white Gaussian channel, Source coding, Entropy coding, introduction to error control coding like Parity codes, Linear block codes, Hamming code and convolution codes.

Text Books:

1. *“Electrical Communication Systems”*, Kennedy, TMH
2. *“Digital Communications”* Sanjay Sharma, S.K. Kataria & Sons, New Delhi
3. *“An Introduction To Analog And Digital Communication”*, Haykins, Wiely Pbs

Reference Books:

1. Analog and digital communication, Roden, PHI pbs.
2. Communication engineering, Singh & Sapre PubTMH Pbs

Chhattisgarh Swami Vivekanand Technical University, Bilai

Semester: 5th
Subject: Electrical Machine -II Lab
Total practical periods: 40
Total Marks in end Semester Exam: 40

Branch: Electrical Engg.
Code: 324521 (24)

List of experiments: (To be performed minimum 10 experiments)

- 1) Determination of synchronous impedance of alternator by open & short circuit test.
- 2) Determination of X_d & X_q by slip circuit.
- 3) Determination of Regulation of a Three-Phase Alternator by Direct Loading.
- 4) Synchronizing of Alternator by lamp method.
- 5) To determine regulation by MMF method.
- 6) Determine of Potier Reactance X_p by Zero Power Factor Saturation curve.
- 7) Plotting of V-curve of synchronous Motor.
- 8) Determination of mechanical losses of 3-phase induction motor by no-load test.
- 9) Determination of circuit parameter of 3-phase induction motor by open & block rotor test.
- 10) Study of Induction Motor Starters.
- 11) Measurement of Speed of Induction Motor by Measuring Rotor Frequency.
- 12) Identification of stator winding of three-phase induction motor.
- 13) Study of reversal 3-phase induction motor.
- 14) Study of braking of 3-phase induction motor.
- 15) Effect of variation of rotor resistance on X_s torque slip characteristics of 3-phase induction motor.
- 16) To determine the negative sequence reactance of a synchronous generator.
- 17) To determine the positive sequence reactance of a synchronous generator.
- 18) Determination of vector group of a three-phase transformer for zero degree phase displacement.
- 19) Determination of vector group of a three-phase transformer for 180° phase displacement.
- 20) Determination of vector group of a three-phase transformer for $+30^\circ$ and -30° phase displacement.

Requirement:

- 3-phase Alternators
- Resistive Load.
- 3-phase induction motor
- Single phase variac
- Three phase Variac
- Ammeter, Voltmeters, Wattmeters.
- Induction Motor.
- Starters

Reference Book:

- Electrical machines, Nagrath and Kothari

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th
Subject: Electronic & Instrumentation Lab
Total practical periods: 40
Total Marks in end Semester Exam: 40

Branch: Electrical Engg.
Code: 324522 (24)

List of experiments: (To be performed minimum 10 experiments)

- Measurement of angular displacement using capacitive transducer.
- Measurement of displacement using LVDT.
- Measurement of force using strain gauge.
- Measurement of pressure using Si sensor.
- Measurement of intensity of light.
- Measurement of displacement using inductive pick-up.
- Measurement of liquid level using capacitive pick-up.
- To demonstrate the operation of 7 segment display.
- To demonstrate the operation of D/A converter.
- To demonstrate the operation of A/D converter.
- To Study Piezo-electric transducer.
- Determination of gauge factor using strain gauge.
- Measurement of temperature using phototransistor demonstration set up.
- Measurement of force using strain gauge force transducer.
- Measurement of displacement using capacitive pickup.

Apparatus Required:

- CRO,
- Multimeter, Pin type patch cords,
- Study Kits or Set-Up for respective experiments.

Reference Book:

- "Electronic Instruments and Instrumentation Technology" by M.M.S. Anand, PHI Pbs.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th
Subject: Analog Electronics Lab
Total practical periods: 40
Total Marks in end Semester Exam: 40

Branch: Electrical Engg.
Code: 324523 (24)

List of experiments: (To be performed minimum 10 experiments)

- Measurement of parameters of an operational amplifier:
 - Open Loop gain
 - I/P bias and offset currents.
 - I/P offset voltage
 - Slew rate
 - CMRR
- To generate a square wave for a specified frequency and duty cycle, using Op Amp IC 741
- To design an astable multivibrator using IC 555 timer for a given frequency.
- To design a monostable multivibrator using IC 555 timer for a specified width period.
- To study a emitter follower.
- To study a cascaded amplifier.
- To perform an adder operation using Op-Amp.
- To perform a subtractor operation using a Op-Amp.
- To perform a differentiator operation using an Op-Amp.
- To perform an integrator operation using an Op-Amp.
- To operate a Class A amplifier.
- To operate a class B amplifier.
- To operate a class C amplifier.
- To operate a class AB amplifier.
- To study the non-inverting & inverting operation of an Op-Amp.

Apparatus Required:

- IC-741
- Bread Board
- Resistors
- Connecting wires
- Capacitors
- Signal Generator
- CRO
- Digital Multimeter

Reference Book:

- Integrated Circuit - Botkar
- Introduction to OP-Amp- Gaykawad

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 5th
Subject: Control System Lab
Total practical periods: 40
Total Marks in end Semester Exam: 40

Branch: Electrical Engg.
Code: 324524 (24)

List of Experiments: (To be performed minimum 10 experiments)

- To determine the Gain of an Open Loop and Closed Loop System.
- To Study the Effect of Disturbance On an Open loop and Closed Loop System.
- To Determine the Transfer function of a DC Servomotor.
- To Study the time response of a second order system.
- Characteristics of Synchro Transmitter and Receiver Pair.
- Determination of Transfer Function of an AC Servomotor.
- To study a potentiometer as an Error Detector.
- Study of bode Plot of a Type 0, Type Type II Systems and I.
- Displacement Measurement using LVDT.
- Simulation of Transfer Function using Op-Amp (Analog Computer Trainer)
- Study of P, PI controller on second order system.
- Study of PID controller on second order system.
- To study the operation and Characteristic of a Stepper Motor.
- To study the Lag Compensator and Lead Compensator.
- To study the Lag-Lead Compensator.

Apparatus Required:

- An open and closed loop system with two input signals (one acting as reference and the other as the disturbance signal).
- A R-L or R-C Circuit, Bread board, CRO, Multimeters, Function Generator.
- Synchro Transmitter-receiver Pair.
- An AC Servomotor.
- A Potentiometer.
- Bode Plot Analyzer.
- Linear Variable Differential Transformer.
- Analog Computer trainer
- P, PI, PID Controller trainer.
- Stepper Motor.
- Lag Compensator, Lead Compensator, Lag-Lead Compensator.

Reference Books:

- 1) Control System Engg. By Nagrath and Gopal, JW
- 2) Linear control systems; Prof. B.S.Manke, Khanna Publication.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : B.E. V
Subject : **Personality Development**
No. of Periods : 2 pds/week
Total Marks in End Semester Exam. : NIL

Branch : **Common to All Branches**
Code : **300525 (46)**
Tutorial Periods : NIL
Teacher's Assessment: 20Mks

Objective: The course is introduced to develop one's outer and inner personality tremendously and enrich the abilities to enable one to meet the challenges associated with different job levels. Personality Development is essential for overall development of an individual apart from gaining technical knowledge in the subject.

Unit – I

Personality concepts:

- **What is Personality** – its physical and psychic aspects. How to develop a positive self-image. How to aim at Excellence. How to apply the cosmic laws that govern life and personality.
- How to improve Memory. **How to develop successful learning skills. How to develop and effectively use one's creative power.**
- **How to apply the individual MOTIVATORS that make you a self-power personality.**

Unit – II

Interpersonal Skills:

- **Leadership:** Leaders who make a difference, Leadership: your idea, What do we know about leadership? If you are serious about Excellence. Concepts of leadership, Two important keys to effective leadership, Principles of leadership, Factors of leadership, Attributes.
- **Listening:** Listening skills, How to listen, Saying a lot- just by listening, The words and the music, How to talk to a disturbed person, Listening and sometimes challenging.
- **How to win friends** and influence people, How to get along with others. How to develop art of convincing others. How can one make the difference? How to deal with others particularly elders. Conflicts and cooperation.

Unit – III

Attitudinal Changes:

- **Meaning of attitude**, benefits of positive attitudes, how to develop the habit of positive thinking.
- **Negative attitude and wining:** What is FEAR and how to win it. How to win loneliness. How to win over FAILURE. How to win over PAIN. How to win over one's ANGER and others anger. How to overcome CRITICISM. What is stress and how to cope up with it? What is crisis and how to manage it.
- How to apply the **character MOTIVATORS** that elevate you and your personality to the top, the art of self motivation.
- How to acquire **mental well-being**.
- How to acquire **physical well-being**.
- How to formulate effective **success philosophy**.

Unit –IV

Decision Making:

How to make your own LUCK. How to plan goals/objectives and action plan to achieve them. How to make RIGHT DECISION and overcome problems. How to make a Decision. Decision making : A question of style. Which style, when ? People decisions : The key decisions. What do we know about group decision making ? General aids towards improving group decision making. More tips for decisions of importance.

Unit – V

Communication Skills:

- **Public Speaking:** Importance of Public speaking for professionals. The art of Speaking - Forget the fear of presentation, Symptoms of stage fear, Main reason for speech failure, Stop failures by acquiring Information; Preparation & designing of speech, Skills to impress in public speaking & Conversation, Use of presentation aids & media.
- **Study & Examination:** How to tackle examination, How to develop successful study skills.
- **Group discussions:** Purpose of GD, What factors contribute to group worthiness, Roles to be played in GD.

Reference Books:

1. How to develop a pleasing personality by Atul John Rego, Better yourself books, Mumbai, 2000.
2. How to Succeed by Brain Adams, Better Yourself books, Mumbai, 1969.
3. Basic Managerial skills for all by E. H McGrawth, Prentice Hall India Pvt Ltd, 2006.
4. The powerful Personality by Dr Ujjwal Patni & Dr Pratap Deshmukh, Medident Publisher, 2006.
5. Great Words win Hearts by Dr Ujjwal Patni, Fusion Books, 2006.
6. Personality : Classic Theories & Modern Research; friedman ; Pearson Education 2006.
7. How to win friends and influence people by Dale Carnigie, A.H. Wheeler 2006.