TEACHING & EVALUATION SCHEME (2010-2011)

DISCIPLINE : ELECTRICAL ENGINEERING SEMESTER : FIFTH (NEW)

SlNo.	Subject	Teaching Scheme			Evaluation Scheme					Total Marks
	Theory	L	T	P	Theory			Practical		
					End Exam	Internal Assesment		End Exam	Sessional	
						Class Test	Assignment			
Th1	Energy Conversion-II	4	1	0	80	15	5			100
Th2	Power Electronics & Drives	4	1	0	80	15	5			100
TH3	Microprocessor & its Interfacing	4	1	0	80	15	5			100
Th4	Computer Network & Administration	4	0	0	80	15	5			100
Th5	Electrical Drawing	8	0	0	100	0	0		50	150
	Practical									
Pr.1	Electrical Lab Pr.II	0	0	6				50	50	100
Pr.2	Power Electronics Lab	0	0	3				25	25	50
Pr.3	Microprocessor Lab	0	0	3				25	25	50
	Grand Total	24	3	12						750

NOTE : Evaluation for I.A (Theory) & Sessional Practical to be made as per guidelines of SCTE & VT,Orissa.

SYLLABUS

5TH SEMESTER

ELECTRICAL ENGINEERING

THEORY-1

1. ENERGY CONVERSION-II

Total Period – 75
Theory-04 p/week
Tutorial – 01 p/week

Examination : 3 Hours
Total Marks : 100
Theory – 80, IA : 15 + 5

A. RATIONALE

Modern industries are mostly equipped with AC machines, because supply of AC system is prevailing in the country. So the higher level diploma students of fifth semester are given a scope to study all most all electrical machines like synchronous generators, synchronous Motors, induction motors, single phase induction motors and fractional horse power motors and other special machines in this subject of Energy conversion II. The chapters deal with Machine construction, working principles, starting, speed control and performance characteristics with mathematical problems whenever applicable.

B. OBJECTIVES

1. To describe various parts, their material specification with suitable reasoning and working principle of induction motors, synchronous motor, synchronous generators, single phase AC motors and fractional horse power and other special machines.
2. To describe their operating principle and working characteristics.
3. To describe the losses and efficiency of all three phase machine like induction motor, synchronous motor, synchronous generator.
4. To describe methods of starting and speed control of AC motors.
5. To workout problems on generator EMF and load sharing of alternators.
6. To describe different test on such three phase machine.
7. To derive torque equation of above motors.

C. TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topic	Periods
1.	Induction Motor	14
2.	Alternator	12
3.	Synchronous Motor	08
4.	Single Phase induction motor	08
5.	AC commutator motors	06
6.	Special Electric Machine	05
7.	Three phase transformers	07
	Total	**60**

D. COURSE CONTENT IN TERMS OF SPECIFIC OBJECTIVES

1. INDUCTION MOTOR

1.1. Explain and derive production of rotating magnetic field.
1.2. Explain principles of operation.
1.3. Explain constructional feature-squirrel cage and slip rings induction motors.
1.4. Explain & derive slip and relationship with rotor copper losses.
1.5. Derive Torque during starting and running.
1.6. Derive for Rotor copper losses, rotor output and gross Torque.
1.7. Derive relation between full load torque and starting torque etc.
1.8. Derive condition for maximum torque under running condition
1.9. Derive Torque-Speed and load current speed characteristics.
1.10. Explain and state Methods of starting, different types of starter.
1.11. Explain speed control by pole changing, Rotor Rheostatic control, voltage control.
1.12. Describe motor enclosures.
1.13. Explain Induction Generator's and state its applications.

2. ALTERNATOR

2.1 State types of alternator.
2.2 Describe constructional details of non salient and salient pole rotor.
2.3 Describe constructional details of stator.
2.4 Explain armature winding, short pitch winding, pitch factor, distribution factor,
2.5 Derive E.M.F equation.
2.6 Explain Armature reaction.
2.7 Explain Alternator on load. (Solve problems)
2.8 Draw the phasor diagram of loaded alternator. (Solve problems)
2.9 Draw the characteristic of Alternator.
2.10 State and explain open circuit and short circuit tests (Solve problems)
2.11 Determination of regulation of Alternator by direct loading and synchronous impedance method.
2.12 Explain parallel operation and load division using synchroscope & dark and bright lamp method.

3. SYNCHRONOUS MOTOR

3.1 Explain construction.
3.2 Explain principles of operation, phasor diagram
3.3 Explain effect of varying load with constant excitation.
3.4 Explain effect of varying excitation with constant load.
3.5 Derive torque, power developed
3.6 Explain power angle characteristics of cylindrical rotor motor.
3.7 Explain effect of excitation on Armature current and power factor.
3.8 Explain Hunting & function of Damper Bars.
3.9 State application.

4. SINGLE PHASE INDUCTION MOTOR

4.1 Explain Single phase Rotating – field theory of 1-phase induction motor.
4.2 Explain Ferrair's principle, net torque
4.3 Explain capacitor motor with principle.
4.4 Explain split phase motor with principle.
4.5 Explain shaded pole motors with principle.

4.6 Explain their speed torque characteristics performance characteristics, applications.

5. COMMUTATOR MOTORS

5.1 Explain single phase series motor & Universal motors with principle.
5.2 Explain Repulsion Motors with principles.

6. SPECIAL ELECTRIC MACHINE

6.1 Principle of Stepper motor
6.2 Classification of Stepper motor.
6.3 Principle of variable reluctant stepper motor.
6.4 Principle of Permanent magnet stepper motor.
6.5 Principle of hybrid stepper motor.
6.6 Applications of Stepper motor.

7. THREE PHASE TRANSFORMERS

7.1 Explain Grouping of winding, Advantages.
7.2 Explain parallel operation of the three phase transformers.
7.3 Explain tap changer (On/Off load tap changing)
7.4 State maintenance of Transformers.

TEXT BOOK

1. A text book of Electrical Technology Part-II- by B. L. Theraja (S. Chand)
2. Electric Machines – by Ashfaq Husain (Dhanpat)

REFERENCE BOOKS

1. Electrical Machine - by J. B. Gupta.
2. Electrical Machines - by S. K. Bhattacharyya.
3. Electrical machine – D. P. Kothari, I. J. Nagrath

N. B. – After completion of each topic the students are required to submit assignment on concepts and applications. It is also required to solve mathematical problems as and when applicable.

ELECTRICAL ENGINEERING
5TH SEMESTER
THEORY-2

POWER ELECTRONICS AND DRIVES

Total : 75 p
Theory : 4p / week
Tutorial – 1P/w

Examination : 3 Hours
Total Marks : 100
Theory – 80, IA – 15 + 5

A.RATIONALE

The power electronics and drives is an inter disciplinary area using the members of thyristors of thyristors family to control the electronics switching action and the principle of control theory. This subject is mainly applicable for industrial application. In this subject the concept of AC line conditioning and different type of welding and heating has also been included.

B. OBJECTIVE

One completion of the subject the student will be able to

1. Understand principle, construction & application of different power devices.
2. Know different gate triggering circuits.
3. Understand principle of phase controller rectifier.
4. Understand principle of inverter.
5. Understand principle of chopper.
6. Understand principle Cyclo converter.
7. Understand principle of AC & DC motor drive.
8. Know different application of ACR.

C.TOPICS WISE DISTRIBUTION OF PERIODS

Sl. No.	Topic	Periods
1.	Thyristor principle & Characteristics	8
2.	Gate triggering circuits	5
3	Phase control Rectifier	8
4.	Inverter	7
5.	Chopper	7
6.	Cyclo converter	3
7.	Modern semiconductor devices	7
8.	A.C. & D.C motor drives	8
9.	Thyristor application	7
	Total	**60**

D. COURSE CONTENT IN TERMS OF SPECIFIC OBJECTIVES

1. THYRISTOR; PRINCIPLE AND CHARACTERISTIC

1.1 Introduction to power Electronics.
1.2 Thyristor family.
1.3 Principle of operation of SCR.
1.4 Static Anode-cathode Characteristics of SCR.
1.5 Two transistor model of SCR.
1.6 Gate characteristics of SCR.
1.7 Switching characteristic of SCR.
1.8 Turn on methods of SCR.
1.9 Turn off methods of SCR.
1.10 SCR voltage and current ratings.

2. GATE TRIGGERING CIRCUITS

2.1 Firing of SCR (a) Gate current amplitude (ii) Gate pulse duration.
2.2 Pulse Transformer.
2.3 Optical Isolator.
2.4 Gate Triggering circuits – i) Resistance firing ii) Resistance capacitance firing.
2.5 Unijunction Transistor (i) Basic operation, ii) UJT Relaxation Oscillator.
2.6 Gate Triggering by UJT.

3. PHASE CONTROLLED RECTIFIER (CONVERTER) (PRINCIPLE OF OPERATION WITH CKT DIAGRAM AND DC VOLTAGE AND D. C CURRENT EQUATION ONLY)

3.1 Introduction
3.2 Phase Angle control and quadrant of operation.
3.3 Single phase half wave converter with resistive and resistive inductive load.
3.4 Effect of freewheeling D code.
3.5 Single phase full wave converter with resistive and resistive inductive load.
a) Midpoint converter.
b) Bridge converter.
3.6 Effect of freewheeling diode on full wave convertor.
3.7 Single phase half controlled bridge convertor for resistive and resistive inductive load.
3.8 Power factor improvement.
3.9 3ϕ full wave phase controller Rectifier with resistive load.
3.10 6ϕ full wave phase controlled rectifier with resistive load.

4. INVERTER

4.1 Introduction.
4.2 Invertor classification.
4.3 Voltage source series inverter.
4.4 Voltage source Parallel inverter (single phase).
4.5 Voltage source half and full Bridge Inverter (M C Murray)
4.6 Current source Inventor.
4.7 Single phase capacitor commutated current source inverter with resistive load.

5. CHOPPER (PRINCIPLE OF OPERATION WITH CIRCUIT DIAGRAM)

5.1 Introduction.
5.2 Principle of step down and step up chopper operation
5.3 Chopper configuration and quadrant of operation.
5.4 Type A, B, C, D and E chopper.
5.5 Chopper source filter.

6. CYCLO CONVERTER

(Principle of operation with circuit diagram)
6.1 Introduction.
6.2 Basic principle of operation.
6.3 Single phase to single phase cycle converter with resistive load.

7. MODERN POWER SEMICONDUCTOR DEVICES AND ITS PROTECTION

7.1 Construction and principle of operation.

7.2 Power Diode, BJT, MOSFET and IGBT.

7.3 Over voltage condition and over voltage protection.

7.4 Over current fault condition and over current protection.

7.5 Gate protection.

8. A.C & D.C MOTOR DRIVE

8.1 Single phase half wave converter drive armature voltage control of D. C. motor.

8.2 Single phase half bridge full bridge control conver drive.

8.3 Single phase half bridge controlled conver drive for flux control of D.C. motor.

8.4 Single phase half controlled bridge converter for D.C. service motor.

8.5 Speed control of Induction motor by stator voltage control.

8.6 Speed control of IM by stator voltage/frequency control.

8.7 Speed control of SR IM by motor resistance control.

8.8 Speed control of SRIM by slip power recovery method. (scherbias Drive)

9. THYRISTOR APPLICATIONS

9.1 Single phase half wave / full wave A. C regulator with resistance load.

9.2 Two stage / multistage sequence control of single phase A.C voltage.

9.3 Switch mode power supply

a) Buck converter.

b) Boost converter.

c) Buck-boost convertor.

d) Bridge converter.

9.4 (UPS) Uninterruptable power supply (principle & operation).

TEXT BOOK

Power Electronics – by M. D. Singh and K.B Khanchandani (TMH)

REFERENCE BOOK

Power Electronics – by Dr. P. S. Bhimbhra (Khana)

ELECTRICAL ENGINEERING
5TH SEMESTER
THEORY-3
MICROPROCESSOR AND ITS INTERFACING

Total Period– 75 Examination : 3 Hours

Theory : 4p/w Total Marks : 100

Tutorial-1 p/w Theory – 80, IA – 15 + 5

A. RATIONALE

The Microprocessor control has taken predominance over other types of control quite some time past. Starting from Electrical Power plant to consumer electronics this tiny chip finds extensive uses. As such Microprocessors have made pervading influence on our lives. This field is developing so rapid that it is difficult to keep track with the changes. Under this subjects Architecture and instruction sets of 8 bit and 16 bit processor have been discussed. Some applications have also been included through the interfacing chips.

B. OBJECTIVE

On completion of the subject, the students will be able to :

1. The students will able to differentiate between 8085 & 8086 microprocessor.
2. Classify Bus.
3. Describe the Architecture of 8085 microporcessor.
4. Comprehend different instructions of 8085 microprocessor.
5. State & explain addressing modes.
6. Write instructions under different addressing modes.
7. Discuss assembler.
8. Explain basic assembler directives.
9. Describe types of assembly language programs and write programs.
10. Explain the timing diagrams of different instructions.
11. State the functions of the interfacing chips like 8255, 8259, 8259 etc.
12. Explain the delay subroutine.
13. Calculate the delay in ms by one, two or three registers.
14. Explain ADC & DAC ?
15. Explain the use of ADC & DAC modules in time delay subroutine ship 0800.
16. Write a program for traffic light control.
17. Apply programming technique for stepper motor control.

C.TOPIC WISE DISTRIBUTION OF RECORDS

Sl. No.	Topic	Periods
1.	Introduction to microprocessor & Micro controller	3
2.	8085A microprocessor Architecture	6
3.	Instruction set of Intel 8085A	8
4.	8085 A programming	12
5.	Memory and I/O Interfacing	6
6.	Peripheral Interface	12
7.	Interfacing DAC & ADC	8
8.	Application of 8085 A	5
	Total	**60**

D. COURSE CONTENT IN TERMS OF SPECIFIC OBJECTIVES

1. INTRODUCTION OF MICROPROCESSOR & MICRO COMPUTER

1.1 Evaluation of microprocessor.

1.2 Advantage of microprocessor.

1.3 Application of microprocessor.

1.4 Micro computer.

2 8085 A MICRO PROCESSOR

2.1 Architecture of intel 8085A Microprocessor

2.2 Functional Block diagram

2.3 Description of each block.

2.4 Interface Section.

a) Address Bus, b) Data Bus, c) Control Bus

2.5 Pin diagram and description.

2.6 Clock plus generation and reset circuit.

3 INSTRUCTION SET OF INTEL 8085A

3.1 Execution Timings Instruction.

3.2 Symbols and abbreviations.

3.3 Addressing modes

3.4 Grouping of Instruction.

3.5 Explanation of different group instructions with examples.

3.6 8085A timing states.

3.7 Instruction fetching and execution.

3.8 Timing diagram of different machine cycle.

3.9 Effect of addressing mode on execution timing.

3.10 Condition flags.

4 8085A PROGRAMMING

4.1 Assembly language

4.2 Hand assembler and cross assembler.

4.3 One pass assembler and two pass assembler.

4.4 Advantage of assembly language.

4.5 Advantage of high level language.

4.6 Operating system soft ware

4.7 Modular and structure programming.

4.8 Micro programming.

4.9 Counter and time delay.

4.10 Stack and sub routine.

4.11 Example of assembly language programming.

5 MEMORY AND I/O INTERFACING

5.1 Primary memory

a) Ram, b) PROM c) E PROM d) EE PROM

5.2 RAM

5.3 Secondary Memory.

5.4 Internal organization of RAM and ROM

5.5 Addressing memory location

5.6 Chip select generation of memory.

5.7 I/O port addressing.

5.8 Generation of chop select.

6 PERIPHERALS

6.1 Programmable peripheral interface Intel -8255

a) Functional block diagram.

b) Operation of 8255

c) Programming of 8255

6.2 Programmable Interval timer INTEL – 8253 (8254)

a) Functional block diagram and interfacing.

b) Description of operational modes.

c) Programming.

6.3 Priority interrupt controller INTEL – 8259

a) Functional block diagram and description of blocks.

b) Interrupt modes.

c) Programming of 8259.

6.4 Serial communication and (USART) INTEL – 8251

a) Communication models.

b) Methods of communication.

c) Functional block diagram and description of blocks of INTEL 8251.

d) Programming the 8251.

7 INTERFACING DAC & ADC

7.1 DA converter specification.

7.2 AD convertor specification.

7.3 AD output codes.

7.4 The DAC 0808 principle of operation.

7.5 Application of DAC for speed control of DC Motor.

7.6 The ADC 0801 principle of operation with example.

8 APPLICATION OF 8085 A

8.1 Digital clock

8.2 Traffic light controller.

TEXT BOOK

1. Micro processor and Inter facing – by Sunetra Choudhury & S. P. Chowdhury (Scitec)
2. Micro processor and Micro controller – by S. K. Mandala (TMH)
3. Fundamentals of Microprocessor & Micro Computers- by B.Ram,Danpatri 7th edition.

REFERENCE BOOK

1. Micro processor Architecture programming & Application with 8085 – by R.S Gaonkar (Peneram)

ELECTRICAL ENGINEERING
5TH SEMESTER
THEORY-4
COMPUTER NETWORK & ADMINISTRATION

Total Period– 60 | Examination : 3 Hours
Theory : 4p/week | Total Marks : 100
Theory – 100, IA – 15 + 5

A. RATIONALE

Data communication is a complex communication phenomenon compared to conventional voice communication. Various media for communication are used now-a-days. Data communication requires pre-defined protocols by virtue of which data can be communicated between computer system having different architecture. Specialized network devices are designed to suit different network architecture & topology. Data communication through computer networks need administration of networks for efficient operation & management.

B. OBJECTIVE

After successful completion of the subject, students will be able to –

1. Know basic of data communication.
2. Know reliable data transfer mechanism.
3. Know the interfacing of different components.
4. Know the application of network, its structure & standards.
5. Know LAN signaling, Access & Standard.
6. Know interconnecting devices.
7. Know the fundamentals of TCP/IP.
8. Evaluate the performance of LAN.
9. Get acquaintance with LAN installation & maintenance.

C. TOPICS WISE DISTRIBUTION OF PERIOD

Sl. No.	Topics	Periods
1.	Basic Data communication	4
2.	Reliable data Transmission	4
3.	Connection and Interfacing	4
4.	Multiplexing	2
5.	Network Applications	4
6.	Network structure	4
7.	Standards	6
8.	Lan signaling and access	8
9.	Popular lan standards	8
10.	Inter connection & Interoperability	8
11.	Installation and Management	8
	Total	**60**

D. COURSE CONTENT IN TERMS OF SPECIFICATION OBJECTIVES

1. BASIC OF DATA COMMUNICATION

1.1 Introduction to Data Transfer

1.2 Asynchronous & Synchronous Transmission

2. RELIABLE DATA TRANSMISSION

2.1 Data Transfer rate, Chennel capacity

2.2 Packet Switching.

2.3 Different methods of Error Detection,
Error Recovery of Error Correction,
Flow Control.

3. CONNECTIONS AND INTERFACING

3.1 Introduction to serial and parallel connections.

3.2 Half Duplex, Full Duplex, parallel connection.

3.3 IEEEP1394, RJ-45 Modular Connection Modem.

4. MULTIPLEXING

4.1 Concepts of Multiplexing.

5. NETWORK APPLICATIONS

5.1 Introduction, Network Uses, Central Services

5.2 LAN environment, Device Device Sharing, Print, Servers.

5.3 Directory Services, Network, Benefits, Network Disadvantages.

6. NETWORK STRUCTURES

6.1 Topologies, BUS, RING, STAR

6.2 Structured Wiring Systems, Media, Twisted
Pair, Coaxial Cable, Fiber Optic.

7. STANDARDS

7.1 Introduction to OSI reference model, Seven.
Layer Model, Physical Layer, Data Link Layer, Network
Layer, Transport Layer, Session Layer, Presentation.
Layer, Application Layer.

7.2 Advantages of layering & Existing standards.

8. LAN SIGNALING AND ACCESS

8.1 Signaling, Base band,

8.2 Manchester encoding & differential Manchester Encoding.

8.3 Modulation techniques : Phase Modulation

8.4 4 bit/6bit Encoding (4b/5b)
5 bit/6bit encoding (5b/6b)

8.5 Broadband and carrier band

8.6 Access : Carrier Sense Multiple Access (CSMA), P-persistent CSMA, CSMA/CD (Collision Detection), CSMA/CA (Collision Avoidance)

8.7 Token passing, Token Ring, Token Bus, Slotted Ring, Demand Priority, Fast switching

9. POPULAR LAN STANDARDS

9.1 Different LAN standards : IEEE 802.3 10 base 5, 10 base 2, 10 base T, Switched Ethernet, IEEE 802, IEEE 802.5 Token Structure, JEEE 802.6 IEEE 802.1, IEEE 802.12 Physical Layout, Data Encoding and Transmission, FDDI, ATM

10. INTERCONNECTION

10.1 Use of Repeaters, Bridges, Routers, Gateways, Public Networks, X.25, Frame Relay

11. INTEROPERABILITY

11.1 Protocol Suite : TCP/IP

12. PERFORMANCE 03

12.1 Throughput, Trade off, Reliability

13. INSTALLATION AND MANAGEMENT

13.1 Procedure of Installation

13.1.1 Pre-installation

13.1.2 Cable Installation

13.1.3 Network Equipment Installation

13.1.4 Post installation

13.2 Management of Technical Issues, UNIX tools, Equipment, Human Related Issues.

TEXT BOOKS

1. Data communication & Computer Networks by W. Stallings – PHI, New Delhi
2. Computer Network by A.S. Tanenbum – PHI, New Delhi
3. Introduction to LAN by Peter Hodson, BPB Publications.

ELECTRICAL ENGINEERING

5TH SEMESTER

THEORY-5

ELECTRICAL DRAWING

Total Period– 120
Theory : 8p/w

Examination : 4 Hours
Total Marks : 150
Theory – 100
Sessional – 50

A. RATIONALE

A technician can take help of an engineering drawing to understand the machines and accessories. So electrical drawing II is introduced to the final year technical student in their 5th semester with assembled and dissembled views of machine like. Three phase alternator, induction motors, transformers of various types. Circuit diagrams of AC motors starters, single phase and three phase winding diagrams and alternators and induction motors with conventional symbols.

Sketching as to BIS and REC specification and symbol of electrical earthing installations, SP and DP structures and substations of 132/33 kv and 33/11 kv type. This will enable them to follow engineering drawing in the working environment.

B. OBJECTIVE

1. To draw assembled view of dissembled parts of machines and transformers.
2. To draw dimensional drawing of machines.
3. To develop the ability to identify different parts of electrical machines and prepare list of materials for various parts.
4. To draw circuit diagram for different AC motor starters.
5. To follow BIS and REC standard to draw earthing installation and SP and DP Structures and stay sets for line supports.
6. To use various symbols to draw the single line diagram of 33/11kv substations.

C. TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topic	Periods
1.	Diagram	15
2.	D.C M/C parts	15
3.	A.C M/C parts	15
4.	1 φ and 3 φ transformer	15
5.	Sketches of Earthing and LT and HT line	12
6.	Single line diagram sub station	15
7.	3 φ Induction motor	15
8.	CAD	18
	Total	**120**

D. COURSE CONTENT IN TERMS OF SPECIFIC OBJECTIVES :

1.DRAW WIRING DIAGRAM OF FOLLOWING

1.1 3 point D. C. motor starter.
1.2 4 point D.C. motor starter.
1.3 Drum controller
1.4 DOL starter
1.5 Star delta starter.
1.6 Auto Transformer Starter.
1.7 Rotor resistance starter.
1.8 Control 2 lamp from 5 position.

2. DRAW D.C. M/C PARTS (Dimensional Drawing)

2.1 Pole with pole shoes (D.C.)
2.2 Commutator (D.C)
2.3 Armature (D.C)
2.4 D. C. armature winding
(a) Simple lap winding
(b) Simple wave winding.

3.DRAW A.C. MACHINE PARTS (Dimensional Drawing)

3.1 Alternator Stator without winding.
3.2 Alternator Rotor for salient pole type.
3.3 Alternator Rotor for smooth cylindrical type.

4. DRAW 1-PHASE & 3-PHASE TRANSFORMER (Assembly Drawing)

4.1 Stepped core type.
4.2 Plane shell type.

5.DRAW SKETCHES OF THE FOLLOWING AS PER B. I.S AND REC SPECIFICATIONS

5.1 Earthing installation.
5.2 Double pole structure for LT and HT distribution lines.

6.DRAW SINGLE LINE DIAGRAM OF SUBSTATION

6.1 Single line diagram of 33/11kv distribution substation.
6.2 Single line diagram of a 11/0.4 kv distribution substation.

7.DRAW DIMENSIONAL DRAWING OF VARIOUS PARTS OF 3-PHASE INDUCTION MOTOR SUCH AS

7.1 Sta
tor
7.2 Squirrel cage rotor.
7.3 Phase wound type rotor.

8. COMPUTER AIDED ELECTRICAL DRAWING USING SOFT WARE

8.1 Draw Electrical symbols (take Print out)
8.2 Draw D.C. m/c parts (take print out)
8.3 Draw A. C. m/c parts (take print out)
8.4 Draw A. C. & D. C. winding diagrams (take print out)
8.5 Draw electrical layout of diagram of Electrical Installation of a building.

TEXT BOOK

1. Electrical Design and drawing – by Surjit Singh (Dhanpat)
2. Electrical Engineering Drawing – by C.R. Darga (Asian)

PR 1. ELECTRICAL LAB PRACTICE-II

Total Period – 90
Periods : 6p/week

Examination : 4 Hours
Total Marks : 100
Practical – 50,
Sessional : 50

1. Study of direct on line starter, stare-delta starter.
2. Auto transformer starter and rotor resistance starter connection and running a 3-phase induction motor and measurement of starting current.
3. Control the speed of Induction motor using electronic circuit. (Thyristor, DIAC and TRIAC)
4. Reverse the direction of rotation of single phase and three phase Induction motor.
5. Heat run test of 3-phase transformer.
6. OC and SC test of alternator and determination of regulation by synchronous impedance method.
7. Determination of regulation of alternator by direct loading.
8. Parallel operation of two alternators.
9. Measurement of power of a 3-phase circuit to a 3-phase wattmeter.
10. Connection of 3-phase energy meter to a 3-phase load.
11. Connection and running of 1-phase motor – (a) Capacitor start motor (b) Shaded pole motor.
12. Study of an O.C.B.
13. Study of induction type over current / reverse power relay.
14. Study of Buchholz's relay.
15. Study of an earth fault relay.
16. Dismantling of a single phase capacitor motor and study its winding connection.
17. Measurement of power of a 3φ circuit by two voltmeter method with inductive and capacitive load.

PR 2. POWER ELECTRONICE LAB.

Total Period - 45 Examination : 4 hours

No. of Periods – 3p/week Sessional : 25

Examination - 25

1. Study switching characteristics of a transistor.
2. Study switch mode regulator.
3. Study Inverter circuit.
4. Study SCR characteristics Triggering of SCR
   (a) Phase controlled
   (b) UJT controlled
   (c) Cosine controlled
5. Study TRIAC characteristics and full wave voltage control method of it.
6. Study DIAC characteristics.
7. Study drive circuit for SCR & TRIAC using DIAC.
8. Study drive circuit for SCR & TRIAC using UJT.
9. Study UPS & CVT.
10. Study servo stabilizer.
11. Construct battery charger.
12. Construct voltage regulation using IC 78XX, 79XX, LM317.
13. Construct & test IC regulation using IC723.
14. To obtain characteristics of the IGBT.
15. To study control of DC load using SCR full control bridge rectifier.
16. To study series Inverter and single-phase Cyclo-converter.
17. To study chopper circuit.
18. To perform the speed control of DC motor using SCR & UJT.

PR-3. MICROPROCESSOR & INTERFACING LAB.

Total Period - 45 | Examination : 4 hours

No. of Periods – 3 p/ week | Sessional : 25

Examination - 25

A. General Programming using 8085A development board

1. a) 1'S Complement.
   a) 2'S Complement.
   b) Addition of 8-bit number.
   c) Subtraction of 8-bit number.
2. a) Decimal Addition 8-bit number.
   b) Decimal Subtraction 8-bit number.
   c) Addition of two 8-bit & result in 16-bit.
3. a) Compare between two numbers.
   b) Find the largest in an Array.
4. a) Multiplication of 8-bit.
   b) Division of 8-bit.
5. a) Bloch Transfer.
   b) Inter change of Bloch data.
6. a) Ascending order / descending order.
   b) Conversion (Binary to Hex/Hex to Binary)
   9 Matching of Bits / Logical operation.
7. Check the execution of a programme by single step meth.

B. Interfacing using 8085

1. Glow of a light (Moving light/Dancing Light) using
2. Display your name using monitor display using 8279.
3. Traffic light control using 8255.
4. Analog to Digital conversion & vice versa.
   a) ADC
   b) DAC
5. Generation of square wave using 8255
6. Steeper motor control.