

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of Teaching and Examination

B.E. VII SEMESTER ELECTRICAL ENGINEERING

S.No.	Board of Studies	Subject Code	Subject	Periods per week			Scheme of Exam Theory/ Pract.			Total Marks	Credit L+(T+P)/2
				L	T	P	ESE	CT	TA		
1	Electrical Engg.	324711 (24)	High Voltage Engineering	4	1	-	80	20	20	120	5
2	Electrical Engg.	324712 (24)	Electrical Machines -III	4	1	-	80	20	20	120	5
3	Management	324713 (36)	Management Concepts & Techniques	3	1	-	80	20	20	120	4
4	Electrical Engg.	324714 (24)	Non Conventional & Renewable Energy Sources	3	1	-	80	20	20	120	4
5	Refer Table -2		Professional Elective-II	4	1		80	20	20	120	5
6	Electrical Engg.	324721 (24)	High Voltage Engineering Lab	-	-	3	40	-	20	60	2
7	Electrical Engg.	324722 (24)	Electrical Machines –III Lab	-	-	3	40	-	20	60	2
8	Electrical Engg.	324723 (24)	Electric Machine Design Lab	-	-	4	40	-	20	60	2
9	Electrical Engg.	324724 (24)	Minor Project	-	-	4	100	-	40	140	2
10	Management	300725 (36)	Innovative & Entrepreneurial Skills	-	-	2	-	-	40	40	1
11	Electrical Engg.	324726 (24)	**Practical Training Evaluation and Library	-	-	1	-	-	40	40	1
Total				18	5	17	620	100	280	1000	33

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

****To be completed after VI Sem. and before the commencement of VII Sem.**

**Table -2
Professional Electives-II**

S.No	Board of Studies	Subject Code	Subject
1.	Electrical Engg.	324751 (24)	<i>Power Apparatus System</i>
2.	Electrical Engg.	324752 (24)	<i>Digital Image Processing</i>
3.	Electrical Engg.	324753 (24)	<i>Micro- wave & Antenna</i>
4.	Electrical Engg.	324754 (24)	<i>Systems Software</i>
5	Electrical Engg.	324755 (24)	<i>Modeling & Simulation</i>
6	Electrical Engg.	324756 (24)	<i>Advanced Microprocessor</i>

Note (1) – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

Note (2) – Choice of elective course once made for an examination cannot be changed in future examinations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 7th

Subject: High Voltage Engineering

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324711 (24)

Total Tut Periods: 12

UNIT I: Breakdown in Gases

Gases as insulating media, Ionization processes, Electron avalanche, Townsend's criterion for breakdown, streamer theory of breakdown, Gaseous discharge in uniform field, Paschen's law, Breakdown in non-uniform field, corona discharges, effect of polarity on corona & breakdown voltage. Corona in transmission lines, Empirical formulae for corona loss, Methods of reducing corona loss.

UNIT II: Dielectrics

Liquid Dielectrics: conduction & breakdown in pure liquids, Conduction & breakdown in commercial liquids, Methods for determination of breakdown strength. Factors affecting dielectric strength of liquids.

Solid Dielectrics: -Breakdown mechanism, Intrinsic breakdown, Electromechanical breakdown, thermal breakdown, breakdown of solid dielectric in practice, Breakdown due to treeing & tracking, breakdown due to the internal discharges.

UNIT III: Generation of high voltages

Generation of high D.C. voltages, half wave & full wave rectifier circuits, Van De Graff generators, Electro-static Generators, Generation of high alternating voltages, cascade transformers, Generation of impulse voltages, Multistage Impulse generator, Marx circuit, Tripping & control of Impulse generators

UNIT IV: Measurement of high Voltages

Measurement of high D.C.voltage, Measurement of high A.C.& impulse voltages, series Impedance voltmeter, series capacitance voltmeter capacitance potential dividers & capacitance voltage transformers, Resistance potential dividers, Electrostatic voltmeter, Spark gap for measurement of high D.C., A.C. & impulse voltages, Potential divider for impulse voltage measurements, CRO for impulse voltage measurements.

UNIT V:

High Voltage Testing of Electrical Apparatus: Test on insulators, Dry & wet flash Over tests & withstand tests, Impulse flash over & withstand voltage test, High voltage tests on cables Impulse testing of transformers.

Non-Destructive Testing: Measurement of dielectric constant & loss factor, High voltage Schering Bridge, Partial Discharge Measurements.

Text Books:

1. High Voltage Engineering by M.S. Naidu & V.Kamraju, TMH Pbs.
2. An introduction to high voltage engineering, Subir Ray, PHI.

Reference Books:

1. High voltage Insulation Engineering by Ravindra Arora, New Age International.
2. High Voltage Engineering By Dr.R.S.Jha, Dhanpat Rai & Sons.
3. Extra High Voltage A.C. Transmission Engineering by R.D. Begamudre Wiley Eastern Limited.
4. High voltage Engineering by D. V. Razevig and Chaurasia, khanna pbs.

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Semester: 7th

Subject: Electrical Machines III

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324712 (24)

Total Tut Periods: 12

UNIT I: Theory Of Ideal Synchronous Machines

The ideal synchronous machine, synchronous machine inductances, transformation to direct and quadrature axis variables, basic machine relation in $dq0$ variables, steady state analysis using $dq0$, transient analysis, three-phase short circuit, transient power angle characteristics, effect of additional rotor circuits.

UNIT II: Theory Of Ideal Poly-Phase Induction Machines

The ideal induction machine, transformation to dq variables, basic machine relation in dq variables, steady state analysis using $dq0$, electrical transients in induction machine, single phasing of three-phase induction motor, power invariance.

UNIT III: Fractional Horse Power Motor

Qualitative examination, starting and running performance of single phase induction motor, revolving field theory of single-phase induction motor, AC tachometer, unbalanced operation of symmetrical two-phase machine, the symmetrical component concept, two-phase control motors.

UNIT IV: AC Commutator Motors

Rotational EMFs in commutator windings, action of commutator as frequency converter, effect of EMF injection in secondary circuit of three-phase slip-ring induction motor, secondary (slip) power, constant HP and constant torque drives, Kramer and Scherbius system of speed control, single-phase series motors, universal motors, phasor diagrams, methods of improving commutation.

UNIT V: Special Motors

Hysteresis motor, reluctance motor, stepper motor, Synchros and linear induction motor, Permanent magnet brushless BC motor.

Text Books:

1. Electrical machines by Fitzgerald and Kingsley, 2nd edition, McGrawHill.
2. Performance and design of AC commutator machines by Taylor.

Reference Books:

1. Generalized theory of electrical machines by Bimbhra, Khanna Pbs.
2. Power system stability, vol-3 by Kimbark, Wiely
3. General theory of electrical machines by Adkins.

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Semester: 7th

Subject: Management Concepts And Techniques

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324713 (24)

Total Tut Periods: 12

UNIT I:

Basic management and techniques: Planning, nature purpose and objectives of planning, organizing, nature and purpose of organizing, authority and responsibility, staffing, supply of human resources, performance appraisal, controlling, system and process of controlling, control techniques.

Human resource management: nature and scope of human resource planning, training and development, recruitment and selection, career growth, absenteeism, grievances, motivation and its types, need of motivation, reward and punishment, models of motivation, leaders, types of leaders, leadership styles, roles and functions of leaders, conflict management, types and causes of conflict, group and team working, organizational design and development.

UNIT II

Marketing management: marketing environment, customer markets and buyer behavior, marketing mix, advertising and sales promotion, channels of distribution.

Financial management and accounting concepts: book keeping, financial statements analysis, financial ratios, capital budgeting, and breakeven analysis.

UNIT III

Production/operations management: planning and design of production and operations systems, facilities planning, location, layout and movement of materials, materials management and inventory control, maintenance management, PERT and CPM.

UNIT IV

Management information systems: role of information in decision making, information system planning, design and implementation, evaluation and effectiveness of the information system, statistical quality control, total quality management and ISO certificate.

UNIT V

Social and ethical issues in management: ethics in management, social factors, unfair and restrictive trade practices.

Strategic and technology management: need, nature, scope and strategy SWOT analysis, value chain concept.

Text Books:

1. Industrial management and engineering economics, K. C. Arora, Khanna Pbs.
2. Industrial engineering and production management, Martand Telsang, S. Chand
3. Industrial management and organization, Ahuja, Khanna Pbs.
4. Industrial engineering and management, O. P. Khanna, DRD

Reference Books:

1. Industrial organization and management, Ramchandran, Ramana Mutrhy, TMH.
2. Management science, Ramchandra, TMH.
3. Industrial engineering and production management, Mahajan, DRP.
4. Management theory and practice, Chandan, Vikas Pbs.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 7th
Subject: Non-Conventional And Renewable Energy Sources
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.
Code: 324714 (24)
Total Tut Periods: 12

UNIT I: Current Energy Systems

Energy utilization: energy characteristics, different forms of energy, energy use, role of energy consumption.

Energy resources: classification of energy resources, availability of commercial primary energy sources (coal, oil, natural gas, hydro power), exploitation of commercial primary energy resources, economic growth and energy demand, Renewable energy sources potential, solar energy, thermal energy, wind energy, biological conversion.

Energy conversion technologies: electricity generation, transport energy, rural energy, and limitations of current power generation systems

UNIT II: Wind Energy

Wind power plant, classification of wind power plant, principles of power generation, wind turbine operation and control, site selection, artificial winds, aero-electric plant, low wind speed turbines, energy storage scheme, wind diesel hybrid system.

UNIT III

Geothermal Energy: types of geothermal energy, hydrothermal systems, geopressured systems, petrothermal systems.

Ocean Energy: ocean energy conversion technologies, open or Claude cycle, closed cycle, problems in harnessing ocean thermal plants, limitations of ocean thermal plants.

UNIT IV: Solar Energy

Solar radiation, solar collectors, solar power tower, conversion of solar heat into energy, solar water heaters, solar ponds, solar cookers, solar refrigeration, solar water pumps, limitations of solar energy.

UNIT V: Energy conversion systems

Fuel cells: principle, advantages, disadvantages, and applications,

Solar cells: Theory and operation of solar cells, advantages, disadvantages and applications.

Biomass and bio-energy: biomass conversion, combustion of biomass, thermo chemical and biochemical conversion, biogas applications, advantages.

Textbooks:

1. "Power plant technology", Wakil, McGraw Pbs.
2. "Renewable energy sources and their environmental impact", Abbasi and Abbasi, PHI Pbs.

Reference books:

1. "Non conventional energy resources", Singhal, Kataria Pbs.
2. "Generation of electrical energy", B. R. Gupta, S Chand.
3. "Energy technology", Rao and Parulekar, Khanna Pbs.

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Semester: 7th

Subject: Power Apparatus System

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324751 (24)

Total Tut Periods: 12

UNIT I: Transmission Line Design & Overhead Line Design

Types of Insulator, String Efficiency, Improvement of voltage distribution, Improvement of String Efficiency, Line Supports, Types of Steel Towers, Cross Arms, Equivalent span, Conductor configurations, Spacing & Clearance, Sag & Tension calculations, Erection conditions, Factors affecting Sag, Sag Template, Catenary, Vibration of conductors & prevention, Selection of conductor size, Cross arm, No. Of circuits, Selection of ground wire

UNIT II: Electrical Substation & Earthing:

Types of Substation, Layout and Bus Bar schemes, Voltage level, Substation equipments Protection & Control Substation Earthing, Tolerance limits of body currents, Soil resistivity, Earth resistance, Tolerable & Actual Step & Touch Voltages, Design of Earthing Grid, Tower Footing Resistance, Measurement of soil & earth resistivity

UNIT III: Power System Earthing:

Ground versus isolated neutral, Solidly and effectively grounded system Resistance and Impedance Grounding, Resonant Grounding, Reactance Grounding, Voltage Transformer Grounding, Zigzag Transformer Grounding, Grounding practice, Effect of grounding on system over voltages & protection over voltage and over voltage phenomenon in isolated and grounded neutral system.

UNIT IV: Surge Protection & Insulation Co-ordination:

External and Internal over voltages mechanism of lightning discharge, wave shapes of stroke current line design based on direct stroke, over voltage protection, earth wire Rod gap T.F.R., Expulsion tube, surge diverter. General idea, Selection of B.I.L., International recommendation, Selection of arrester rating, Co-ordination of protector devices with apparatus insulation

UNIT V: Reliability of Transmission & Distribution Systems:

Definition, Outage, Bath Tub Curve, Two State Model, Failure & Repair Rate, Probability Density Function, Probabilities of Survival & Failure, Mean Time to Failure, Mean Down Time, Reliability of Series & Parallel Systems, Two-State Fluctuating Environment, Approximate Method, Reliability Planning, Preparation of Reliability Models.

Textbook:

1. Power System Analysis & Design by B.R. Gupta –S.Chand
2. Sub Station Design and Equipment - Gupta & Satnam (Dhanpat Rai & Sons)

Reference books:

1. Transmission & Distribution – Westinghouse
2. A Course in Electrical Power – J.B. Gupta, Kataria

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Semester: 7th

Subject: Digital Image Processing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324752 (24)

Total Tut Periods: 12

UNIT I: Fundamentals of Image Processing

Origins of Digital Image Processing, Examples of fields that use Digital Image Processing, Fundamental steps, Components, Elements of Visual Perception, Light and the Electromagnetic Spectrum, Sensing and Acquisition, Sampling and Quantization Relationship between Pixels.

UNIT II: Image Enhancement in the Spatial Domain

Gray Level Transformation, Histogram Processing, Enhancement using Arithmetic or Logic Operation, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters, Image Enhancement in the Frequency Domain, Introduction to the Fourier Transform, Smoothing frequency – Domain Filters, Sharpening Frequency Domain Filters.

UNIT III: Image Restoration

Models of Image Degradation, Noise Models, Restoration in the presence of Noise, Periodic Noise Reduction, Linear, Position-Invariant Degradations, Inverse Filtering.

UNIT IV: Colour Image Processing

Fundamentals, Colour models, Pseudocolour Image Processing, Basics of Full-Colour Image Processing, Colour Transformations, Smoothing and Sharpening, Colour segmentation, Noise in Colour Images.

UNIT V: Image Compression

Fundamentals, Image Compression Models, Elements of Information Theory, Error Free compression, Lossy Compression, Image Compression Standards.

Text Book:

1. Digital Image Processing by Rafael E. Gonzalez & Richard E. Woods, LPE, Pearson Edu. India.
2. Fundamentals of Digital Image Processing by Anil. K. Jain, LPE, Pearson Edu. India.

Reference Books:

1. Digital image Processing by William .K. Pratt, John Wiley & Sons Publisher

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Semester: 7th
Subject: Micro-Wave And Antenna
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.
Code: 324753 (24)
Total Tut Periods: 12

Unit I: Micro –wave tubes & solid-state devices

Klystrons, traveling wave tube (TWT), BWO (back wave oscillator) Magnetrons, varactor diodes, step recovery diode, pin diode, Tunnel diode, gun diode
IMPATT Diode, TRAPATT diode, BARITT diode, parametric amplifier

Unit II: Microwave measurement

Microwave bench –General measurement, measurement device & instrumentations, frequency measurement of phase shift. Measurement of VSWR, Measurement of impedance

Unit III: Microwave propagation

Modes of propagation: Ground wave propagation, SKY wave, space wave, troposphere's scatter propagation

Unit IV: Microwave Integrated Circuit

Introduction, materials used for MMIC 'S fabrication thin film devices, planar transmission lines, Hybrid integrated circuit, fabrication, use of GaAs for building microwave integrated circuit, applications

Unit V: Antennas

Definition, Isotropic radiators, Radiators, radiation pattern Lobes gain, directive gain, power gain, directivity, antenna efficiency front to back ratio, antenna Beam width polarization Antennas.

Micro wave Antenna: - Horn, parabolic reflectors Lens antenna, slot antennas, micro strip antennas

Textbooks:

1. Microwave & Radar Engineering, M.Kulkarni (Umesh Pbs)
2. Antenna & Wave Propagation, K.D.Prasad (Satya Prakashan)

Reference books:

1. Antennas, John D.Kraus (TMH)
Electromagnetic wave & Radiating System, Edward C. Jordan Keith G. Bal main (PHI)

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Semester: 7th
Subject: System Software
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.
Code: 324754 (24)
Total Tut Periods: 12

UNIT-I

Machine structure: - memory, registers, Data & instruction Formats C Languages Vs Assembly Languages, Addressing Modes, Data Transfer operations, Arithmetic Instructions, Compare & Branch Instructions, Logical & shift Operations, Subroutines in Assembly Languages.

Unit-II

Assemblers: Introduction to Translators: Interpreters vs. Compilers, Definition of an assembler, Symbol Tables, Table Processing-Search & sort Techniques, Design of an Assembler, Assembler Directives & Assembler Schemes, Single pass & multi pass Translators, Intermediate Code Forms, and List Generation & Error Indication

Unit-III

Macros & Conditional Assembly: Macro Definition, Feature of Macro facility, Macroinstruction arguments, conditional Macro Expansion, Label in macros, Macro calls within macros, Use of macros, Implementation of Macros in assemblers.

Unit-IV

Loaders Features & Linker Editors: Automatic Library Search, Loader Design Options, Load Address & Address Origin, Loading Libraries, Program Forms & self Relocation. Linkage Editors, Dynamic Linking, Bootstrap Loaders.

Unit- V

Software Tools: Text Editors: Word Processors, MS DOS EDLIN editor, Binary File Editors MS DOS DEBUG Editor, Debug command line Arguments, Loading & manipulating of addresses & data.

Textbooks:

1. System software by D.M.Dhamdhare (TMH)
2. System Programming by J.J.Donovan (TMH)
3. Microcomputer System: 8086/8088 & Family-Architecture & Design by Liu & Gibson, PHI

Reference Books:

1. Advanced Dos by Michael Hyman & Ray Duncan (Ms-press).
2. Ms-Dos User's manual (MS-Press)
3. Structured programming in Assembly Languages for IBM-PC by William C.Runion.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 7th
Subject: Modeling & Simulation
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.
Code: 324755 (24)
Total Tut Periods: 12

Unit-I

System Models & Role of simulation: Basic concept & nomenclature, Types of system-Determination, Stochastic, Continuous & Discrete Systems, System Simulation-Uses of simulation & its limitation, Steps in simulation studies-Statistical Tool: Generation & Testing of pseudorandom numbers, Random variate generation for Uniform, Exponential Normal & poisson distributions, Sampling & Estimation, Maximum Likelihood estimation, Confidence interval estimation.

Unit –II

Discrete Event Simulation: -Representation of time, Approach to discrete event simulation Queuing Models- Single & multi-server queues, Steady state behavior of queues, Network of queues, Inventory System simulation, Programming languages for discrete system simulation-GPSS, SIMSCRIPT (Brief overview)

Unit-III

Modeling & performance Evaluation of computer Systems: Behavioral, Data flow & structural modeling, Overview of hardware, Modelling & Simulation, Simulation for behavioral model, Evaluation of multiprocessor systems, workload characterization & Benchmarks.

Unit-IV

Continuous System Simulation: Continuous System Models-Open & closed loop systems, Model described by differential equations, Systems dynamics, Growth & decay models, Systems dynamics diagram, Simulation of aircraft models, Biological & sociological systems simulation, Simulation Languages Overview-CSMP.

Unit-V

Virtual Reality Modeling: Overview of Virtual Reality Modeling Language VRML 2.0, creating dynamic worlds, integrating JavaScript's either VRML Verification & Validation of Simulation Models: Goals of Model Verification & validation, Input data Analysis, Output Analysis, Sensitivity analysis, Hypothesis testing, Performance measures & their estimation

TextBooks:

1. Discrete System Simulation, J.E.Banks, Prentice Hall
2. System Simulation, G.Gordon, PHI
3. Computer Systems Performance Evaluation, D.Ferrari, Prentice Hall

Reference Books:

1. A VHDL Primer, J.Bhastav, Prentice Hall

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 7th

Subject: Advanced Microprocessors

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical Engg.

Code: 324756 (24)

Total Tut Periods: 12

UNIT I: architecture and Instruction set for 8086: Architecture and pin configuration of 8086, instruction format, addressing modes, data transfer instruction, arithmetic instructions, Branching & Looping Instructions, NOP and Halt, Flag Manipulation Instructions, Logical, shift and Rotate Instruction, Byte and String Manipulation: string Instructions; REP Prefix, Table Translation, Number Format conversions. Assembler Directives and Operators; Assembly Process; Translation of assembler Instructions, Programming of Microprocessor 8086.

UNIT – 2: System Bus Structure: Basic 8086/8088 system bus architecture, Minimum mode Configuration, Maximum mode Configuration; memory interfacing with 8086/8088 in minimum and maximum mode; system Bus standards. Interrupts of Microprocessor 8086.

UNIT – 3: Advanced Microprocessor architecture: CPU 80386 Architecture and functional pin diagram, Function of Bus Interface unit, Execution unit, control unit, Instruction decoder Unit, Segmentation unit & page unit, General purpose Registers, Flag Register, Test & Debug Register, and Pipelining. Addressing mode and Instruction set of microprocessor 80386.

UNIT – 4: Task and Modes of Operation: Real mode, Virtual Mode, Protected Mode, Page based Virtual Memory, Single level tasks: Segment Register, segment descriptors, Local descriptor table, Global Descriptor Register, Interrupt Descriptor Register, Multilevel tasks: Gate Descriptor, Task state segment, Task switch; Task gate descriptors, Related Instructions, Page descriptors, addressing technique. Address Calculation, Segment and Page Protection, Scaling; Bit Addressing, Programmer invisible register, Cache Memory, Virtual memory, Types of cache.

UNIT – 5: Multiprocessor Configuration & Interfacing: Numeric data Processor 8087; I/O Processor 8089, Communication between CPU and IOP, Related Instruction; Interfacing and programming of programmable peripheral interface 8255 and programmable interrupt controller 8259 with microprocessor 8086.

Text Books:

1. Microcomputer Systems: 8086/8088 Family – Architecture, Programming, and Design; Y.Liu and G.A. Gibson; PHI.
80386 Microprocessor Handbook: C.H.Pappas and W.H. Murray: Osborne McGraw Hill.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 7th

Subject: High Voltage Engg. Lab

Total practical periods: 40

Total Marks in end Semester Exam: 40

Branch: Electrical Engg.

Code: 324721 (24)

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

- High voltage DC Testing of cables.
- Measurement of peak value of voltage by Ryall Crest Voltmeter.
- Comparison of dielectric strength of air and insulating oil (X-mer oil).
- Determine the break down voltage of x'mer oil for airgap with different electrodes.
- Study of 100 kv power frequency, high field voltage X'mer & it's accessories.
- **To determine the break down voltage for two parallel conductors for various spacing**
- **Determination of string efficiency of insulator string with guard ring.**
- Determination of string efficiency of insulator string with out guard rings
- To determine dry and wet flash over voltage of string efficiency.
- To determine flash pt of an oil using pensky marten's apparatus also determine the fire pt.
- To determine flashover voltage of string insulator.
- Measurement of high voltage using Schering Bridge.
- Measurement of Relative permittivity of the given material
- Determination of breakdown voltage Vs distance curve for sphere gap.
- Measurement of rms voltage by X-mer ratio test.

Apparatus Required:

1. HV testing Transformer
2. Voltmeter
3. Power frequency high voltage transformer
4. Sphere sphere arrangement
5. Schering bridge kit
6. Auto transformer
7. Transformer insulating string
8. Oil testing kit

Reference Books:

1. HV Engg. By, Naidu & kamaraju.
2. Electrical instrument & Measurement A.K.Sawhney

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: 7th

Subject: Electrical Machines-III Lab

Total practical periods: 40

Total Marks in end Semester Exam: 40

Branch: Electrical Engg.

Code: 324722 (24)

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

1. Determination of negative sequence reactance of alternator by static test.
2. Determination of negative sequence reactance of alternator by line-to-line short circuit test.
3. Determination of zero sequence reactance by synchronous machine.
4. Determination of the X_d & X_q of syn. Machine.
5. Measurement of circuit Constant of 1-phase induction motor.
6. Speed reversal of 1-phase induction motor.
7. Single phasing characteristics of 3-phase induction motor.
8. To study effect of capacitor on starting, running, and performance of induction motor.
9. Output characteristics of Synchro Transmitter.
10. To use Synchro transmitter pair as remote control device.
11. Characteristics of stepper motor.
12. Measurement of torque angle of synchronous machine.
13. Study of Linear Induction Motor.
14. Characteristics of 1-Phase AC commutator motor.
15. To control the speed of Induction Motor by ejecting EMF from rotor.

Requirement: -

1. 3-Phase Alternator
2. 1-Phase Induction motor, 3-Phase Induction Motor(Slip ring & case)
3. Stepper Motor
4. Synchro Transmitter
5. Linear Induction Motor.
6. AC Commutator Motor.
7. Ammeter, Voltmeter
8. 1-Phase & 3-Phase Variacs.
9. Rheostats, resistive Load.

Reference Books:

1. Generalised Theory of machines, Bimbhra, Kahnna Pbs.
2. Electrical machines, Bimbhra.

Chhattisgarh Swami Vivekanand Technical University, Bilai

Semester: 7th
Subject: Electrical Machine Design Lab
Total practical periods: 50
Total Marks in end Semester Exam: 40

Branch: Electrical Engg.
Code: 324723 (24)

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

(A) Design of Transformers.

1. Main dimensions & core section.
2. Windings.
3. Tank.

(B) Design of D.C. Machines.

1. Main Dimensions.
2. Magnetic Circuit.
3. Pole.
4. Yoke.
5. Armature.
6. Armature winding.
7. Field winding (shunt/series).

(C) Design of Induction Motors.

1. Main dimensions.
2. Stator.
3. Cage rotor.
4. Rotor winding.
5. Magnetic Circuit calculations

Books Recommended:

1. Electrical Machine Design By A.K.Sawhney
2. Design of Electrical Machine By V.N. Mittle
3. Principles of Electrical Machine Design By R.K.Agarwal.
4. Performance & design of A.C. Machines By M.G.Say

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: VII
Subject: Innovative & Entrepreneurial Skill
Total Practical Periods: 28
Total Marks in End Semester Exam: ---
Minimum number of class test to be conducted: 2

Branch: Common to all branches
Code: 300725 (36)
Total Tut Periods: NIL

Unit I

Innovation: innovation- an abstract concept; creativity, innovation and imagination; types of innovation -classified according to products, processes or business organizations.

Unit II

Entrepreneurship: who is an entrepreneur? Entrepreneurship- A state of Mind, Emergence of entrepreneur; Role of Entrepreneur; A Doer not a Dreamer- Characteristics of an entrepreneur; Factors affecting entrepreneurial growth – Social, cultural, personality factors, psychological and Social Factors. Impact of Entrepreneurship for sustainable development.

Unit III

Difference between entrepreneur and entrepreneurship, Difference between entrepreneur and intrapreneur, Common Entrepreneurial competencies/Traits; Entrepreneurship stimulants, Obstacles inhibiting Entrepreneurship; Types of entrepreneurs, Functions of an entrepreneur.

Unit IV

Identification of Business Opportunities: Introduction, Sources of Business of Product Ideas, Steps in Identification of Business opportunity and its SWOT Analysis.

UNIT-V

Techno-Economic Feasibility of the project: Introduction, Techno- Economic feasibility of the Project, Feasibility Report, Considerations while preparing a Feasibility Report, Proforma of Feasibility Report, Role of Institutions and entrepreneurship.

Text and Reference Books:

1. Competing through Innovation-Bellon & Whittington, Prentice Hall of India
2. A Guide to Entrepreneurship – David Oates- JAICO Publishing House.
3. Entrepreneurship- Rober D Hisrich, Peters, Shepherd- TMH
4. Entrepreneurship in Action- Coulter, Prentice Hall of India
5. Entrepreneurship Management and Development – Ajith Kumar, HPH
6. Fundamentals of entrepreneurship- Mohanty, PHI
7. Patterns of Entrepreneurship- Jack M Kaplan, Wiley, student Edition.