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Series-parallel Circuits29. Passive Filters30. Ohms Law31. DIGITAL ELECTRONICS32. Quantities and Units33. Series Circuits34. Branch, Loop and Node Analyses35. Alternating Current and Voltage36. Inductors37. RC Circuits38. RLC Circuits and Resonance39. Three-Phase Systems in Power Applications40. Time Response of Reactive Circuits41. Circuit Theorems and Conversions42. OP-AMP Circuits43. ANALOG ELECTRONICS44. SEMICONDUCTOR DIODE46. TRANSISTORS47. TRANSISTOR BIASING48. SINGLE STAGE TRANSISTOR AMPLIFIERS49. Multi-Stage Transistor Amplifiers50. TRANSISTOR AUDIO POWER AMPLIFIERS 51. Operational Amplifier[OP-AMP]52. HYBRID PARAMETERS53. ELECTRONIC INSTRUMENTS54. INTEGRATED CIRCUITS 55. POWER ELECTRONICS56. SCR (Silicon Controlled Rectifiers)57. FET Field Effect Transistors58. Solid-State Switching Circuits59. Regulated D.C. Power Supply60. Modulation and Demodulation61. Transistor Tuned Amplifiers62. Oscillators63. Amplifiers with Negative Feedback64. Parallel Circuits65. EARTHING or GROUNDINGCLICK HERE>BASIC ELECTRONICS Questions and Answers ******Dear Electrical students, We provide Basic Electrical Engineering multiple choice questions and answers with explanation & EEE objective type questions mcqs books pdf free download here. these are very important & Helpful for campus placement test, semester exams, job interviews and competitive exams like GATE, IES, PSU, NET/SET/Jhttps://en.wikipedia.org/wiki/Electrical_engineeringRF, UPSC and diploma.ELECTRICAL Engineering McqsEspecially we are prepare for the Electrical Engineering freshers and professionals, these model questions are asked in the online technical test, Quiz and interview of many companies.These are also very important for your lab viva in university exams like JNTU, Andhra,OU,Anna university,Pune,VTU,UPTU,CUSAT etc.electrical engineering mcq pdfelectrical engineering mcq bookelectrical mcq pdf free downloadmcq on basic electrical engineering pdfelectrical mcq online testelectrical engineering mcq for competitive examElectrical engineering mcqs with answers pdfElectrical engineering mcqs with answersElectrical engineering mcqs questions and answers pdfElectrical engineering mcqs pdf free downloadElectrical engineering mcqs pdf downloadElectrical Engineering objective type Questions pdf free download :- Becoming an electrical engineer requires training, commitment, and the willingness to wonder about questions such as how a flat screen television manages to be energy efficient or how a Las Vegas casino manages to use so much electricity without blowing a fuse. Electrical engineers answer the tough electrical questions and may work on anything from handheld gadgets to massive electrical grids. In getting there, electrical engineers must consider questions such as: What level of degree should I get to maximize my income? What concentration should I learn to obtain my dream career? Do I have to join an engineering firm or can I work on my own? This comprehensive guide is designed as a resource for individuals interested in the electrical engineering career path. Included are the steps to become a qualified electrical engineer, degree paths, potential salaries and projected career growth for specific subfields. What Does an Electrical Engineer Do? Electrical Engineering Career Basics Electrical engineers use physics, electronics and electromagnetism to design devices that are powered by or produce electricity. Electrical engineers work on anything from small pocket devices to large aircraft electrical systems. Engineers test prototypes and evaluate and improve systems. Nearly every industry has a place for an electrical engineer, including government, transportation, communications, technology and utilities. Most electrical engineers work in an office or lab setting, but on-site projects and short-term assignments are common. Show More Electrical Engineer Salaries and Job Outlook Salary Facts and Figures Electrical engineers are well-paid for their work. The Bureau of Labor Statistics reports the median annual wage for electrical engineers was $91,410 in 2014. Engineers working in oil and gas extraction or wireless telecommunications earn particularly high salaries. The top 10 percent of all electrical engineers can earn more than $143,000 a year and engineers in the bottom 10 percent can expect to earn an average of $60,000 annually. The highest earners are located in California, Alaska, Massachusetts, the District of Columbia and Washington state. The map below shows details of the 10th, 50th, and 90th percentile earners for each state. Career Growth and Prospects Electrical engineering jobs are expected to grow at a slower-than-average pace from 2012 to 2022, so picking the right electrical engineering degree is crucial. Engineers who keep up-to-date with industry trends will have an advantage over the competition. Electrical engineering is shifting toward computer systems design and away from traditional manufacturing. Electrical engineers work to build powerful electronics that use computer, cellular and GPS technologies. Constant technological innovation will keep electrical engineers in demand, particularly in the following 10 states, which are projected to have the most job growth from 2012 to 2022: Select a State: Alabama Alaska Arizona California Connecticut Delaware Florida Hawaii Idaho Illinois Indiana Iowa Kansas Louisiana Maine Maryland Massachusetts Michigan Minnesota Missouri Montana Nebraska Nevada New Hampshire New Jersey New Mexico New York North Carolina North Dakota Ohio Oklahoma Oregon Pennsylvania Rhode Island South Carolina South Dakota Texas Utah Vermont Washington State West Virginia Wisconsin Wyoming Steps to Becoming an Electrical Engineer Step 1 Earn a bachelor's degree or higher Most employers require that entry-level electrical engineers hold a bachelor-level electrical engineering degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET). Bachelor's degree coursework typically includes digital systems design, electrical circuit theory and differential equations. In addition to classroom work, electrical engineering majors can participate in laboratory work and field studies. Cooperative engineering degree programs provide the opportunity to integrate classroom skills in real-world environments through internships. Electrical engineering students may be able to combine a bachelor's degree and master's degree with a five-year study program. Electrical engineers who hold a master's degree can take jobs as an instructor at colleges and universities or research and development positions at a private firm. Step 2 Take the Fundamentals of Engineering exam All electrical engineers who work in the utility field must be licensed through the Fundamentals of Engineering (FE) exam. To qualify for licensure, an applicant must have completed a degree from an ABET-accredited engineering program and earn a passing score on the Fundamentals of Engineering (FE) exam. Students can take the FE exam upon graduating with an electrical engineering or related degree. Individuals with a passing grade on the FE are called engineers-in-training (EITs) or engineer interns (EIs) until they pass their Professional Engineer (PE) exam. Step 3 Land an entry-level job and gain experience Advancement in electrical engineering is often based on experience and accomplishments. A graduate degree is not required, but many employers prefer their engineers to keep up with emerging technology. A graduate degree in electrical engineering provides an advantage in the field and leads to faster career advancement. Step 4 Take Professional Engineer exam To qualify for the Professional Engineer (PE) exam, EITs must have four years of relevant work experience. Several states require continuing education for professional engineers to keep their engineering licenses, which means engineers must keep abreast of changes in the field even after earning their PE license. According to a Princeton Review survey, over one-third of electrical engineers own equity in their firm, have started their own company or have filed for a patent. Choosing the Right Academic Path Most electrical engineering careers require at least a bachelor's degree, but electrical engineering degrees at the associate level are also available. All engineering degrees focus heavily on math and science. Classes become more advanced as students progress through their chosen degree plan. Students can choose from multiple electrical engineering degree specializations, such as small-scale electronics or large-scale electrical grids. Several colleges offer online electrical engineering degrees at the associate through graduate levels. Use the following chart to explore more of what each electrical engineering degree can offer graduates: Career Goal and/or educational needs Associate Bachelor's Master's Doctorate Online I want to be able to work full-time while earning my degree. I want to see if I enjoy science and math before pursuing a lengthy degree plan. I want to earn my degree on my own schedule. I want to explore cutting-edge research and programs. I'm interested in teaching others about electrical engineering. I'd like to work for a broadcaster or power station. I'd like to manage large projects involving other engineers. I want to improve consumer electrical products. Three of the 10 most popular universities for a bachelor's degree in engineering are in California: UC Berkeley Cal Poly UCLA In-Depth Review of Degree Options Although pre-engineering programs are available at the associate degree level, electrical engineers must earn at least a bachelor's degree, in which they will learn not only electrical theory, but also how to practically use engineering equipment and analyze electrical schematics they will encounter in the field. Additionally, they will study the different applications for electrical engineering degrees, including how to store energy, make computers run, and establish and maintain functioning communication networks. Some engineers choose to get a master's degree or doctorate, especially if they want to supervise projects or teach university courses. Graduate degrees are also an option for students who want to burnish their credentials in an engineering specialization. Associate Degrees Most employers require electrical engineers to hold a bachelor's degree from a school accredited by the Accreditation Board of Engineering and Technology (ABET), but some colleges still offer associate programs in electrical engineering to serve as a stepping-stone to a four-year degree. Students interested in electrical engineering can get a related degree at the associate level through an engineering technology or pre-engineering program. An associate degree will not provide the same job opportunities, but it can help students determine if they want to continue in the field of electrical engineering. Students in an electrical engineering technology program might take some of the following classes: This general education course covers algebraic concepts, including quadratic, polynomial, linear and radical equations. Skills & Knowledge Gained Use mathematical concepts to solve problems Use technological tools for math This course looks at the inner workings of a computer and how operating systems are organized. Skills & Knowledge Gained Understand the internal structure of computers Assemble basic parts of computer This course examines how electronics systems and circuits work. Students learn about circuit types, electromagnetism, frequency and voltage. Skills & Knowledge Gained Apply electronics principles toward circuit problems Create basic circuits commonly used in electronic devices This course covers data communications between computers, installed software and hardware devices. Content includes coding and decoding, circuit switching and packet switching. Students also learn network protocols and device functions. Skills & Knowledge Gained Design basic network protocols Set up hardware such as printers and scanners so they can communicate with networked computers Bachelor's Degrees A four-year electrical engineering degree prepares students to design and analyze electrical systems. During the course of the degree, students will gain extensive understanding of electrical theory and hands-on experience with circuitry, mechanics, computer programming and thermodynamics. Students can choose to specialize in a related field, such as biomedical engineering or telecommunications engineering. Entry-level math and physics courses are typically prerequisites before students can take specific engineering. In upper-level engineering courses, some programs require students to choose a specialization. As students progress through an electrical engineering bachelor's degree, courses continue to increase in difficulty. A bachelor's degree in electrical engineering from an ABET-accredited program qualifies graduates to take the Fundamentals of Engineering and Principles and Practice of Engineering exams. Students must pass these exams to become licensed professional engineers. Common engineering courses offered at the bachelor's level include: This course introduces students to calculate possible effects of engineering decisions, such as maximizing sound data into minimal bandwidth or managing network traffic. Topics include variables, distribution and density functions, conditional probability and weak and strong laws of large numbers. Skills & Knowledge Gained Calculate probabilities when making engineering decisions Analyze potential variables that may affect systems outcomes This course looks at the transfer of energy and matter, including heat, light, electricity and magnetism. Skills & Knowledge Gained Recognize universal physical laws Apply mathematical and computational techniques to engineering experiments and problems Students in this class learn about forces, fields and waves and how electromagnetic devices work. Course covers electric charges, magnetic poles and field mapping. Skills & Knowledge Gained Understand how transmission lines carry alternate current Use calculus to describe electromagnetic currents Understand how electromagnetic fields are affected by dielectric and magnetic materials This course introduces students to the structure of microprocessors, how they work, how they are used and how they are programmed. Skills & Knowledge Gained Configure microprocessor components such as timers, controllers and analog interfaces Set up microprocessors to interact with external devices Master's Degrees Graduate students often study similar topics as students in a bachelor's program, such as power systems, control systems, and telecommunication systems, but graduate courses go far beyond the materials studied at the bachelor's level and are much more challenging. Additionally, graduate students typically focus on one specific area of electrical engineering, and must demonstrate their knowledge on that topic by completing a project or writing a comprehensive thesis. Graduate students can move into higher-level jobs involving management of projects or engineering teams. Common electrical engineering graduate courses include: This course explains how electrical energy is converted to mechanical energy, underlining the importance of electric power to transmit energy so it can be used in industry and transportation. Students also look at alternative energy systems, including how wind, solar and hydroelectric power are generated. Skills & Knowledge Gained Calculate power flow throughout an electrical system Install and maintain power control equipment, motors and other electrical devices used in manufacturing plants and power plants This class uses physics and chemistry concepts to show how semiconducting materials are used in circuitry and effects on their electrical properties. Skills & Knowledge Gained Describe how electrons are transported and how this affects operation of semiconductor devices Describe how photo detectors, lasers and quantum dots operate This course introduces students to lasers, LEDs and other devices that use light to interact with other materials, providing them with in-depth knowledge of how they work. Skills & Knowledge Gained Solve optical circuit problems Design optical amplifiers, oscillators, detectors and control circuits This course explores mathematical modeling of linear systems in terms of time and frequency of electrical transfer to ensure system stability. Skills & Knowledge Gained Assess stability and performance of linear systems Design lead and lag controllers for linear systems using proper techniques Doctoral Degrees Individuals with a master's degree in electrical engineering or a related field may choose to pursue a doctorate degree in engineering, which opens up opportunities at the top levels of industry and employment in research or teaching. PhD students spend much of their time completing a research dissertation, but are also responsible for taking coursework in a designated specialization. Many doctoral students teach courses to undergraduate students while earning their degree. ABET provides a list of expected student outcomes for electrical engineering programs, which apply to PhD-level programs as well as bachelor's and master's degree programs. Doctorate courses in electrical engineering are more complex and difficult than courses at the bachelor's and master's level and provide mastery in electronics, mathematics, electrical software, technology and theoretical electricity. Upon graduation, doctoral students will have gained expert-level experience with the following skills: Students will have taken hundreds of hours of math courses by the time they receive a doctorate in electrical engineering. ABET asks that doctorate graduates be able to apply their mathematical knowledge to model systems and processes before construction. Analyzing and designing complex electrical devices, software, and systems Doctoral students should, understand how most electrical devices work and be able make improvements based on what end users need. This requires not just an understanding of software or hardware, but also an appreciation of how both components interact. Conducting experiments In order to analyze what works and what doesn't, doctoral students must research processes and electronics. Students conduct experiments on theoretical designs for new electronic systems. Communication Engineering is a complicated field, and many people do not understand electrical engineering systems. As electrical systems continue to grow and expand, engineers must be able to communicate with other industries and business professionals as they work together to improve electrical systems. Electrical Engineering Concentrations Electrical engineers commonly specialize in communications, power systems, control systems, or computer hardware. Most universities allow students to specialize in multiple concentrations depending on course offerings and student desire. Communications Communication moves information from one place to another, via Internet, mobile phones, satellite radio or face-to-face meetings. A specialization in communications covers information theory, wireless networking, noise suppression, compression and security. Graduates in this field often must pass state licensure exams to work in telecommunications and some states require an additional four years of experience before obtaining the title of professional engineer. Designs wireless networks and works with electronic devices that send or receive radio waves. Creates systems and products that enable mass communication from the wireless devices to broadcasting equipment to satellite equipment. Maintains equipment necessary for radio and television broadcast. Power Systems Power system engineers design large-scale power systems for commercial, industrial or residential use. Power system engineers ensure the electrical system is not overloaded and that power is allocated properly between different power grids. Designs and improves industrial facilities' electrical equipment and systems, including transformers and power distribution and coordinates inspection of electrical sites to ensure systems are up to code. Uses engineering software and substation construction to design electrical grids, provide lightning protection and design area lighting. Designs, relocates and upgrades transmission lines with fiber optic additions; works with both wood and steel structure designs Electronic Engineering Electrical engineers study the electromagnetic circuits that make machines run. Engineers design and test electronic components so that that software and hardware work together seamlessly. Uses circuits, microcontrollers and digital signal processors to design and develop controllers that allow machines to work safely and as intended, regulates machines and engines and repairs and modifies systems for optimal function. Uses advanced understanding of electronic engineering to sell scientific products to businesses; explains product modifications to engineers based on customer needs; trains clients on how to use equipment Computer Engineering A computer engineering concentration bridges the gap between computer science and electrical systems and focuses on software-hardware integration. Computer engineers often write the software that makes a computer's components run. Designs computer components, creates blueprints for new computers and updates hardware to work with new software. Designs communication networks to send and receive data via local area network or intranet system linking, secures network data, sources hardware to set up and support the network and installs cables and other network hardware. Earning an Electrical Engineering Degree Online Online degrees provide flexibility for students who cannot or choose not to attend a traditional university. However, not all electrical engineering degrees offer the same program benefits and accreditation. Prospective students should look for the following in any online program: Accreditation Accreditation guarantees the program and school has met required academic standards and allows schools to offer federal financial aid to students. Additionally, graduation from an ABET-accredited program is a prerequisite for professional engineering licensure. Technology Electrical engineers must be familiar with the latest technology. Online engineering programs should offer technology support, such as smartphone applications or streaming video for online studies. Learning Support Electrical engineering involves extensive math and science, and even the best students can find themselves in need of study groups and tutors. Top online programs provide live video tutoring as well as access to math and writing centers. Online Library and Resources Engineering is a rapidly changing and expanding field. Industry trends can change quicker than curricula and an extensive library can help students keep up to date. Students should look for online programs that provide access to the latest scientific articles and industry journals and magazines. Components of a Successful Career as an Electrical Engineer Electrical Engineer Skills Electrical engineers must have a knack for math and science, the ability to analyze systems to understand how they work, the ability to determine how changes affect how system function and knowledge of electrical systems and circuitry. Because electrical engineers often work with team members without an engineering background, engineers must be able to present complex ideas and relay instructions to others. It is imperative that electrical engineers have effective project management, multitasking and time management skills. Electrical engineers must be able to apply academic knowledge to new tasks and to keep up with rapid changes in technology. Electrical Engineer Credentials Individuals in an electrical engineering field can become certified in specific fields of engineering, including: Energy Efficiency Management Certificate: Certification for utility workers to start or improve an energy efficiency program. Electrostatic Discharge Control Technician: Offered by the International Association for Radio, Telecommunications and Electromagnetics for engineers to minimize electrostatic discharge. Associate Systems Engineering Professional: A certification offered to recent college graduates with a systems engineering field concentration. Fiber Optics for Traffic System Technician: Offered to city, county and state transportation workers who install and maintain transportation systems. Tools and Technology for Electrical Engineers Electrical engineers should expect to become familiar with laboratory evaporators, semiconductor systems, signal generators, spectrometers and tube furnaces. Electrical engineers also work with many common engineering software programs, including: Analytical or scientific software Such as Hewlett-Packard HP Semiconductor Parameter Analyzer, Synopsys PrimeTime and Tektronix EZ-TEST Computer-aided design (CAD) software and computer-aided manufacturing (CAM) software Such as Autodesk AutoCAD software, Cadence Encounter Test and MAGIC layout editor Development environment software such as Eclipse IDE software and programmed logic controller (PLC) code-generation software. Object- or component-oriented development software such as C++, Python and Sun Microsystems Java Related Engineering Occupations Engineering professions exist across many skills levels and industries. Here are some quick facts about occupations related to electrical engineering. 3% 7% Salary $105,380 Education and Training: Bachelor's degree in engineering field related to aerospace systems 22% or higher Salary $86,950 Education and Training: Bachelor's degree in biomedical engineering 3% 7% Salary $108,430 Education and Training: Bachelor's degree in computer science or engineering discipline; (optional) postgraduate certifications in various hardware or software systems 8% Salary $77,550 Education and Training: Bachelor's degree in computer science or related field -2% 2% Salary $59,820 Education and Training: Associate degree in electrical engineering technology; (optional) Electrical Power Testing certification -2% 2% Salary $61,580 Education and Training: Bachelor's degree in engineering; (recommended) Professional Engineer licensure 3% 7% Salary $95,790 Education and Training: Bachelor's degree in engineering; (recommended) Professional Engineer licensure 5% Salary $83,060 Education and Training: Bachelor's or master's degree in mechanical engineering; engineering license Sources: Bureau of Labor Statistics, OnetOnline What do other engineers earn? Engineers in related fields are also well-compensated for their education and training: Electrical Engineer and Related Job Salaries \"Subject\";\"10th Percentile\";\"Median Salary\";\"90th Percentile\"\"Electrical Engineers\";56490;87920;136690\"Aerospace Engineers\";65450;103720;149120\"Biomedical Engineers\";52600;86960;139450\"Computer Engineers\";63970;100920;150130\"Mechanical Engineers\";52030;80580;121530' Related Careers at a Glance Become Team Contributing Writer Latest Posts 1. The S.I. unit of power isA. HenryB. coulombC. wattD. watt-hourAnswer: C2. Electric pressure is also calledA. resistanceB. powerC. voltageD. energyAnswer: C3. The substances which have a large number of free electrons and offer a low resistance are calledA. insulatorsB. inductorsC. semi-conductorsD. conductorsAnswer: D4. Out of the following which is not a poor conductor ?A. Cast ironB. CopperC. CarbonD. TungstenAnswer: B5. Out of the following which is an insulating material ?A. CopperB. GoldC. SilverD. PaperAnswer: DCURRENT ELECTRICITY MCQs6. The property of a conductor due to which it passes current is calledA. resistanceB. reluctanceC. conductanceD. inductanceAnswer: C7. Conductance is reciprocal ofA. resistanceB. inductanceC. reluctanceD. capacitanceAnswer: A8. The resistance of a conductor varies inversely asA. lengthB. area of cross-sectionC. temperatureD. resistivityAnswer: B9. With rise in temperature the resistance of pure metalsA. increasesB. decreasesC. first increases and then decreasesD. remains constantAnswer: A10. With rise in temperature the resistance of semi-conductorsA. decreasesB. increasesC. first increases and then decreasesD. remains constantAnswer: A11. The resistance of a copper wire 200 m long is 21 Q. If its thickness (diameter) is 0.44 mm, its specific resistance is aroundA. 1.2 x 10~8 Q-mB. 1.4 x 10~8 Q-mC. 1.6 x 108 Q-mD. 1.8 x 108 Q-mAnswer: C12. Three resistances of 10 ohms, 15 ohms and 30 ohms are connected in parallel. The total resistance of the combination isA. 5 ohmsB. 10 ohmsC. 15 ohmsD. 55 ohmsAnswer: A13. An instrument which detects electric current is known asA. voltmeterB. rheostatC. wattmeterD. galvanometerAnswer: D14. In a circuit a 33 Q resistor carries a current of 2 A. The voltage across theresistor isA. 33 VB. 66 vC. 80 VD. 132 VAnswer: B15. A light bulb draws 300 mA when the voltage across it is 240 V. The resistance of the light bulb isA. 400 QB. 600 QC. 800 QD. 1000 QAnswer: C16. The resistance of a parallel circuit consisting of two branches is 12 ohms. If the resistance of one branch is 18 ohms, what is the resistance of the other ?A. 18 QB. 36 QC. 48 QD. 64 QAnswer: B17. Four wires of same material, the same cross-sectional area and the same length when connected in parallel give a resistance of 0.25 Q. If the same four wires are connected is series the effective resistance will beA. 1 QB. 2 QC. 3 QD. 4 QAnswer: D18. A current of 16 amperes divides between two branches in parallel of resistances 8 ohms and 12 ohmsrespectively. The current in each branch isA. 6.4 A, 6.9 AB. 6.4 A, 9.6 AC. 4.6 A, 6.9 AD. 4.6 A, 9.6 AAnswer: B19. Current velocity through a copper conductor isA. the same as propagation velocity of electric energyB. independent of current strengthC. of the order of a few ^.s/mD. nearly 3 x 108 m/sAnswer: C20. Which of the following material has nearly zero temperature co-efficient of resistance?A. ManganinB. PorcelainC. CarbonD. CopperAnswer: A21. You have to replace 1500 Q resistor in radio. You have no 1500 Q resistor but have several 1000 Q ones which you would connectA. two in parallelB. two in parallel and one in seriesC. three in parallelD. three in seriesAnswer: B22. Two resistors are said to be connected in series whenA. same current passes in turn through bothB. both carry the same value of currentC. total current equals the sum of branch currentsD. sum of IR drops equals the applied e.m.f.Answer: A23. Which of the following statement is true both for a series and a parallel D.C. circuit?A. Elements have individual currentsB. Currents are additiveC. Voltages are additiveD. Power are additiveAnswer: D24. Which of the following materials has a negative temperature co-efficient of resistance?A. CopperB. AluminumC. CarbonD. BrassAnswer: C25. Ohms law is not applicable toA. vacuum tubesB. carbon resistorsC. high voltage circuitsD. circuits with low current densitiesAnswer: A26. Which is the best conductor of electricity ?A. IronB. SilverC. CopperD. CarbonAnswer: B27. For which of the following ampere second could be the unit ?A. ReluctanceB. ChargeC. PowerD. EnergyAnswer: B28. All of the following are equivalent to watt exceptA. (amperes) ohmB. joules/sec.C. amperes x voltsD. amperes/voltAnswer: D29. A resistance having rating 10 ohms, 10 W is likely to be aA. metallic resistorB. carbon resistorC. wire wound resistorD. variable resistorAnswer: C30. Which one of the following does not have negative temperature co-efficient ?A. AluminiumB. PaperC. RubberD. MicaAnswer: A31. Varistors areA. insulatorsB. non-linear resistorsC. carbon resistorsD. resistors with zero temperature coefficientAnswer: B32. Insulating materials have the function ofA. preventing a short circuit between conducting wiresB. preventing an open circuit between the voltage source and the loadC. conducting very large currentsD. storing very high currentsAnswer: B33. The rating of a fuse wire is always expressed inA. ampere-hoursB. ampere-voltsC. kWhD. amperesAnswer: D34. The minimum charge on an ion isA. equal to the atomic number of the atomB. equal to the charge of an electronC. equal to the charge of the number of electrons in an atom (#) zeroAnswer: B35. In a series circuit with unequal resistancesA. the highest resistance has the most of the current through itB. the lowest resistance has the highest voltage dropC. the lowest resistance has the highest currentD. the highest resistance has the highest voltage dropAnswer: D36. The filament of an electric bulb is made ofA. carbonB. aluminiumC. tungstenD. nickelAnswer: C37. A 3 Q resistor having 2 A current will dissipate the power ofA. 2 wattsB. 4 wattsC. 6 wattsD. 8 wattsAnswer: C38. Which of the following statement is true?A. A galvanometer with low resistance in parallel is a voltmeterB. A galvanometer with high resistance in parallel is a voltmeterC. A galvanometer with low resistance in series is an ammeterD. A galvanometer with high resistance in series is an ammeterAnswer: C39. The resistance of a few meters of wire conductor in closed electrical circuit isA. practically zeroB. lowC. highD. very highAnswer: A40. If a parallel circuit is opened in the main line, the currentA. increases in the branch of the lowest resistanceB. increases in each branchC. is zero in all branchesD. is zero in the highest resistive branchAnswer: C41. If a wire conductor of 0.2 ohm resistance is doubled in length, its resistance becomesA. 0.4 ohmB. 0.6 ohmC. 0.8 ohmD. 1.0 ohmAnswer: A42. Three 60 W bulbs are in parallel across the 60 V power line. If one bulb burns openA. there will be heavy current in the main lineB. rest of the two bulbs will not lightC. all three bulbs will lightD. the other two bulbs will lightAnswer: D43. The four bulbs of 40 W each are connected in series swift a battery across them, which of the following statement is true ?A. The current through each bulb in sameB. The voltage across each bulb is not sameC. The power dissipation in each bulb is not sameD. None of the aboveAnswer: A44. Two resistances Rl and Ri are connected in series across the voltage source where Rl>Ri. The largest drop will be acrossA. RlB. RiC. either Rl or RiD. none of themAnswer: A45. What will be energy used by the battery if the battery has to drive 6.28 x 1018 electrons with potential difference of 20 V across the terminal ?A. 5 joulesB. 10 joulesC. 15 joulesD. 20 joulesAns:46. A closed switch has a resistance ofA. zeroB. about 50 ohmsC. about 500 ohmsD. infinityAnswer: A47. The hot resistance of the bulbs filament is higher than its cold resistance because the temperature co-efficient of the filament isA. zeroB. negativeC. positiveD. about 2 ohms per degreeAnswer: C48. Heat in a conductor is produced on the passage of electric current due toA. reactanceB. capacitanceC. impedanceD. resistanceAns:49. The insulation on a current carrying conductor is providedA. to prevent leakage of currentB. to prevent shockC. both of above factorsD. none of above factorsAnswer: C50. The thickness of insulation provided on the conductor depends onA. the magnitude of voltage on the conductorB. the magnitude of current flowing through itC. both A. and B.D. none of the aboveAnswer: A51. Which of the following quantities remain the same in all parts of a series circuit ?A. VoltageB. CurrentC. PowerD. ResistanceAnswer: B52. A 40 W bulb is connected in series with a room heater. If now 40 W bulb is replaced by 100 W bulb, the heater output willA. decreaseB. increaseC. remain sameD. heater will burn outAnswer: B53. In an electric kettle water boils in 10 m minutes. It is required to boil the boiler in 15 minutes, using same supply mainsA. length of heating element should be decreasedB. length of heating element should be increasedC. length of heating element has no effect on heating if waterD. none of the aboveAnswer: A54. An electric filament bulb can be worked fromA. D.C. supply onlyB. A.C. supply onlyC. Battery supply onlyD. All aboveAnswer: D55. Resistance of a tungsten lamp as applied voltage increasesA. decreasesB. increasesC. remains sameD. none of the aboveAnswer: B56. Electric current passing through the circuit producesA. magnetic effectB. luminous effectC. thermal effectD. chemical effect(e) all above effectsAnswer: C57. Resistance of a material always decreases ifA. temperature of material is decreasedB. temperature of material is increasedC. number of free electrons available become moreD. none of the above is correctAnswer: C58. If the efficiency of a machine is to be high, what should be low ?A. Input powerB. LossesC. True component of powerD. kWh consumed(e) Ratio of output to inputAnswer: B59. When electric current passes through a metallic conductor, its temperature rises. This is due toA. collisions between conduction electrons and atomsB. the release of conduction electrons from parent atomsC. mutual collisions between metal atomsD. mutual collisions between conducting electronsAnswer: A60. Two bulbs of 500 W and 200 W rated at 250 V will have resistance ratio asA. 4 : 25B. 25 : 4C. 2 : 5D. 5 : 2Answer: C61. A glass rod when rubbed with silk cloth is charged becauseA. it takes in protonB. its atoms are removedC. it gives away electronsD. it gives away positive chargeAnswer: C62. Whether circuit may be AC. or D.C. one, following is most effective in reducing the magnitude of the current.A. ReactorB. CapacitorC. InductorD. ResistorAnswer: D63. It becomes more difficult to removeA. any electron from the orbitB. first electron from the orbitC. second electron from the orbitD. third electron from the orbitAnswer: D64. When one leg of parallel circuit is opened out the total current willA. reduceB. increaseC. decreaseD. become zeroAnswer: C65. In a lamp load when more than one lamp are switched on the total resistance of the loadA. increasesB. decreasesC. remains sameD. none of the aboveAnswer: B66. Two lamps 100 W and 40 W are connected in series across 230 V (alternating).Which of the following statement is correct ?A. 100 W lamp will glow brighterB. 40 W lamp will glow brighterC. Both lamps will glow equally brightD. 40 W lamp will fuseAnswer: B67. Resistance of 220 V, 100 W lamp will beA. 4.84 QB. 48.4 QC. 484 ftD. 4840 QAnswer: C68. In the case of direct currentA. magnitude and direction of current remains constantB. magnitude and direction of current changes with timeC. magnitude of current changes with timeD. magnitude of current remains constantAnswer: A69. When electric current passes through a bucket full of water, lot of bubbling is observed. This suggests that the type of supply isA. A.C.B. D.C.C. any of above twoD. none of the aboveAnswer: B70. Resistance of carbon filament lamp as the applied voltage increases.A. increasesB. decreasesC. remains sameD. none of the aboveAnswer: B71. Bulbs in street lighting are all connected inA. parallelB. seriesC. series-parallelD. end-to-endAnswer: A72. For testing appliances, the wattage of test lamp should beA. very lowB. lowC. highD. any valueAnswer: C73. Switching of a lamp in house produces noise in the radio. This is because switching operation producesA. arcs across separating contactsB. mechanical noise of high intensityC. both mechanical noise and arc between contactsD. none of the aboveAnswer: A74. Sparking occurs when a load is switched off because the circuit has highA. resistanceB. inductanceC. capacitanceD. impedanceAnswer: B75. Copper wire of certain length and resistance is drawn out to three times its length without change in volume, the new resistance of wire becomesA. 1/9 timesB. 3 times(e) 9 timesD. unchangedAnswer: C76. When resistance element of a heater fuses and then we reconnect it after removing a portion of it, the power of the heater willA. decreaseB. increaseC. remain constantD. none of the aboveAnswer: B77. A field of force can exist only betweenA. two moleculesB. two ionsC. two atomsD. two metal particlesAnswer: B78. A substance whose molecules consist of dissimilar atoms is calledA. semi-conductorB. super-conductoC. compoundD. insulatorAnswer: C79. International ohm is defined in terms of the resistance ofA. a column of mercuryB. a cube of carbonC. a cube of copperD. the unit length of wireAnswer: A80. Three identical resistors are first connected in parallel and then in series.The resultant resistance of the first combination to the second will beA. 9 timesB. 1/9 timesC. 1/3 timesD. 3 timesAnswer: B91. Which method can be used for absolute measurement of resistances ?A. Lorentz methodB. Releigh methodC. Ohms law methodD. Wheatstone bridge methodAnswer: D92. Three 6 ohm resistors are connected to form a triangle. What is the resistance between any two corners ?A. 3/2 Q(b 6 QC. 4 QD. 8/3 QAnswer: C93. Ohms law is not applicable toA. semi-conductorsB. D.C. circuitsC. small resistorsD. high currentsAnswer: A94. Two copper conductors have equal length. The cross-sectional area of one conductor is four times that of the other. If the conductor having smaller cross-sectional area has a resistance of 40 ohms the resistance of other conductor will beA. 160 ohmsB. 80 ohmsC. 20 ohmsD. 10 ohmsAnswer: D95. A nichrome wire used as a heater coil has the resistance of 2 2/m. For a heater of 1 kW at 200 V, the length of wire required will beA. 80 mB. 60 mC. 40 mD. 20 mAnswer: A96. Temperature co-efficient of resistance is expressed in terms ofA. ohms/CB. mhos/ohmC(e) ohms/ohmCD. mhos/CAnswer: C97. Which of the following materials has the least resistivity ?A. ZincB. LeadC. MercuryD. CopperAns:98. When current flows through heater coil it glows but supply wiring does not glow becauseA. current through supply line flows at slower speedB. supply wiring is covered with insulation layerC. resistance of heater coil is more than the supply wiresD. supply wires are made of superior materialAnswer: C99. The condition for the validity under Ohms law is thatA. resistance must be uniformB. current should be proportional to the size of the resistanceC. resistance must be wire wound typeD. temperature at positive end should be more than the temperature at negative endAnswer: A100. Which of the following statement is correct ?A. A semi-conductor is a material whose conductivity is same as between that of a conductor and an insulatorB. A semi-conductor is a material which has conductivity having average value of conductivity of metal and insulatorC. A semi-conductor is one which conducts only half of the applied voltageD. A semi-conductor is a material made of alternate layers of conducting material and insulatorAnswer: A101. A rheostat differs from potentiometer in the respect that itA. has lower wattage ratingB. has higher wattage ratingC. has large number of turnsD. offers large number of tappingAnswer: B102. The weight of an aluminium conductor as compared to a copper conductor of identical cross-section, for the same electrical resistance, isA. 50%B. 60%C. 100%D. 150%Answer: A103. An open resistor, when checked with an ohm-meter readsA. zeroB. infiniteC. high but within toleranceD. low but not zeroAnswer: B104. are the materials having electrical conductivity much less than most of the metals but much greater than that of typical insulators.A. VaristorsB. ThermistorC. Semi-conductorsD. Variable resistorsAnswer: C105. All good conductors have highA. conductanceB. resistanceC. reluctanceD. thermal conductivityAnswer: A106. Voltage dependent resistors are usually made fromA. charcoalB. silicon carbideC. nichromeD. graphiteAnswer: C107. Voltage dependent resistors are usedA. for inductive circuitsB. to supress surgesC. as heating elementsD. as current stabilizersAnswer: B108. The ratio of mass of proton to that of electron is nearlyA. 1840B. 1840C. 30D. 4Answer: A109. The number of electrons in the outer most orbit of carbon atom isA. 3B. 4C. 6D. 7Answer: B110. With three resistances connected in parallel, if each dissipates 20 W the total power supplied by the voltage source equalsA. 10 WB. 20 WC. 40 WD. 60 WAnswer: D111. A thermistor hasA. positive temperature coefficientB. negative temperature coefficientC. zero temperature coefficientD. variable temperature coefficientAnswer: C112. If/, R and t are the current, resistance and time respectively, then according to Joules law heat produced will be proportional toA. I2RtB. I2RfC. I2R2tD. I2R2t*Answer: A113. Nichrome wire is an alloy ofA. lead and zincB. chromium and vanadiumC. nickel and chromiumD. copper and silverAnswer: C114. When a voltage of one volt is applied, a circuit allows one micro ampere current to flow through it. The conductance of the circuit isA. 1 n-mhoB. 106 mhoC. 1 milli-mhoD. none of the aboveAnswer: A115. Which of the following can have negative temperature coefficient ?A. Compounds of silverB. Liquid metalsC. Metallic alloysD. ElectrolytesAnswer: D116. Conductance : mho ::A. resistance : ohmB. capacitance : henryC. inductance : faradD. lumen : steradianAnswer: A117. 1 angstrom is equal toA. 10-8 mmB. 106 cmC. 1010 mD. 10~14 mAnswer: C118. One newton meter is same asA. one wattB. one jouleC. five joul

ExciterAnswer: d15. While conducting short-circuit test on a transformer the following side is short circuited(a) High voltage side(b) Low voltage side(c) Primary side(d) Secondary sideAnswer: b16. In the transformer following winding has got more cross-sectional area(a) Low voltage winding(b) High voltage winding(c) Primary winding(d) Secondary windingAnswer: a17. A transformer transforms(a) voltage(b) current(c) power(d) frequencyAnswer: c18. A transformer cannot raise or lower the voltage of a D.C. supply because(a) there is no need to change the D.C. voltage(b) a D.C. circuit has more losses(c) Faradays laws of electromagnetic induction are not valid since the rate of change of flux is zero(d) none of the aboveAnswer: c19. Primary winding of a transformer(a) is always a low voltage winding(b) is always a high voltage winding(c) could either be a low voltage or high voltage winding(d) none of the aboveAnswer: c20. Which winding in a transformer has more number of turns ?(a) Low voltage winding(b) High voltage winding(c) Primary winding(d) Secondary windingAnswer: b21. Efficiency of a power transformer is of the order of(a) 100 per cent(b) 98 per cent(c) 50 per cent(d) 25 per centAnswer: b22. In a given transformer for given applied voltage, losses which remain constant irrespective of load changes are(a) friction and windage losses(b) copper losses(c) hysteresis and eddy current losses(d) none of the aboveAnswer: c23. A common method of cooling a power transformer is(a) natural air cooling(b) air blast cooling(c) oil cooling(d) any of the aboveAnswer: c24. The no load current in a transformer lags behind the applied voltage by an angle of about(a) 180(b) 120(c) 90(d) 75Answer: d25. In a transformer routine efficiency depends upon(a) supply frequency(b) load current(c) power factor of load(d) both (b) and (c)Answer: d26. In the transformer the function of a conservator is to(a) provide fresh air for cooling the transformer(b) supply cooling oil to transformer in time of need(c) protect the transformer from damage when oil expends due to heating(d) none of the aboveAnswer: c27. Natural oil cooling is used for transformers up to a rating of(a) 3000 kVA(b) 1000 kVA(c) 500 kVA(d) 250 kVAAnswer: a28. Power transformers are designed to have maximum efficiency at(a) nearly full load(b) 70% full load(c) 50% full load(d) no loadAnswer: a29. The maximum efficiency of a distribution transformer is(a) at no load(b) at 50% full load(c) at 80% full load(d) at full loadAnswer: b30. Transformer breaths in when(a) load on it increases(b) load on it decreases(c) load remains constant(d) none of the aboveAnswer: b31. No-load current of a transformer has(a) has high magnitude and low power factor(b) has high magnitude and high power factor(c) has small magnitude and high power factor(d) has small magnitude and low power factorAnswer: d32. Spacers are provided between adjacent coils(a) to provide free passage to the cooling oil(b) to insulate the coils from each other(c) both (a) and (b)(d) none of the aboveAnswer: a33. Greater the secondary leakage flux(a) less will be the secondary induced e.m.f.(b) less will be the primary induced e.m.f.(c) less will be the primary terminal voltage(d) none of the aboveAnswer: a34. The purpose of providing iron core in a step-up transformer is(a) to provide coupling between primary and secondary(b) to increase the magnitude of mutual flux(c) to decrease the magnitude of mag-netizing current(d) to provide all above featuresAnswer: c35. The power transformer is a constant(a) voltage device(b) current device(c) power device(d) main flux deviceAnswer: d36. Two transformers operating in parallel will share the load depending upon their(a) leakage reactance(b) per unit impedance(c) efficiencies(d) ratingsAnswer: b37. If R2 is the resistance of secondary winding of the transformer and K is the transformation ratio then the equivalent secondary resistance referred to primary will be(a) R2/VK(b) R2IK2(c) R22!K2(d) R22/KAnswer: b38. What will happen if the transformers working in parallel are not connected with regard to polarity ?(a) The power factor of the two trans-formers will be different from the power factor of common load(b) Incorrect polarity will result in dead short circuit(c) The transformers will not share load in proportion to their kVA ratings(d) none of the aboveAnswer: b39. If the percentage impedances of the two transformers working in parallel are different, then(a) transformers will be overheated(b) power factors of both the transformers will be same(c) parallel operation will be not possible(d) parallel operation will still be possible, but the power factors at which the two transformers operate will be different from the power factor of the common loadAnswer: d40. In a transformer the tappings are generally provided on(a) primary side(b) secondary side(c) low voltage side(d) high voltage sideAnswer: c41. The use of higher flux density in the transformer design(a) reduces weight per kVA(6) reduces iron losses(c) reduces copper losses(d) increases part load efficiencyAnswer: a42. The chemical used in breather for transformer should have the quality of(a) ionizing air(b) absorbing moisture(c) cleansing the transformer oil(d) cooling the transformer oil.Answer: b43. The chemical used in breather is(a) asbestos fiber(b) silica sand(c) sodium chloride(d) silica gelAnswer: d44. An ideal transformer has infinite values of primary and secondary inductances. The statement is(a) true(b) falseAnswer: b45. The transformer ratings are usually expressed in terms of(a) volts(b) amperes(c) kW(d) kVAAnswer: d46. The noise resulting from vibrations of laminations set by magnetic forces, is termed as(a) magnetostrication(b) boo(c) hum(d) zoomAnswer: c47. Hysteresis loss in a transformer varies as CBmax = maximum flux density)(a) Bmax(b) Bmax1-6(C) Bmax1-83(d) B maxAnswer: b48. Material used for construction of transformer core is usually(a) wood(b) copper(c) aluminium(d) silicon steelAnswer: d49. The thickness of laminations used in a transformer is usually(a) 0.4 mm to 0.5 mm(b) 4 mm to 5 mm(c) 14 mm to 15 mm(d) 25 mm to 40 mmAnswer: a50. The function of conservator in a transformer is(a) to project againstinternal fault(b) to reduce copper as well as core losses(c) to cool the transformer oil(d) to take care of the expansion and contraction of transformer oil due to variation of temperature of sur-roundingsAnswer: d51. The highest voltage for transmitting electrical power in India is(a) 33 kV.(6) 66 kV(c) 132 kV(d) 400 kVAnswer: d52. In a transformer the resistance between its primary and secondary is(a) zero(b) 1 ohm(c) 1000 ohms(d) infiniteAnswer: d53. A transformer oil must be free from(a) sludge(b) odour(c) gases(d) moistureAnswer: d54. A Buchholz relay can be installed on(a) auto-transformers(b) air-cooled transformers(c) welding transformers(d) oil cooled transformersAnswer: d55. Gas is usually not liberated due to dissociation of transformer oil unless the oil temperature exceeds(a) 50C(b) 80C(c) 100C(d) 150CAnswer: d56. The main reason for generation of harmonics in a transformer could be(a) fluctuating load(b) poor insulation(c) mechanical vibrations(d) saturation of coreAnswer: d57. Distribution transformers are generally designed for maximum efficiency around(a) 90% load(b) zero load(c) 25% load(d) 50% loadAnswer: d58. Which of the following property is not necessarily desirable in the material for transformer core ?(a) Mechanical strength(6) Low hysteresis loss(c) High thermal conductivity(d) High permeabilityAnswer: c59. Star/star transformers work satisfactorily when(a) load is unbalanced only(b) load is balanced only(c) on balanced as well as unbalanced loads(d) none of the aboveAnswer: b60. Delta/star transformer works satisfactorily when(a) load is balanced only(b) load is unbalanced only(c) on balanced as well as unbalanced loads(d) none of the aboveAnswer: c61. Buchholzs relay gives warning and protection against(a) electrical fault inside the transformer itself(b) electrical fault outside the transformer in outgoing feeder(c) for both outside and inside faults(d) none of the aboveAnswer: a62. The magnetising current of a transformer is usually small because it has(a) small air gap(b) large leakage flux(c) laminated silicon steel core(d) fewer rotating partsAnswer: a63. Which of the following does not change in an ordinary transformer ?(a) Frequency(b) Voltage(c) Current(d) Any of the aboveAnswer: a64. Which of the following properties is not necessarily desirable for the material for transformer core ?(a) Low hysteresis loss(b) High permeability(c) High thermal conductivity(d) Adequate mechanical strengthAnswer: c65. The leakage flux in a transformer depends upon(a) load current(b) load current and voltage(c) load current, voltage and frequency(d) load current, voltage, frequency and power factorAnswer: a66. The path of the magnetic flux in transformer should have(a) high reluctance(b) low reactance(c) high resistance(d) low resistanceAnswer: b67. Noise level test in a transformer is a(a) special test(b) routine test(c) type test(d) none of the aboveAnswer: c68. Which of the following is not a routine test on transformers ?(a) Core insulation voltage test(b) Impedance test(c) Radio interference test(d) Polarity testAnswer: c69. A transformer can have zero voltage regulation at(a) leading power factor(b) lagging power factor(c) unity power factor(d) zero power factorAnswer: a70. Helical coils can be used on(a) low voltage side of high kVA transformers(b) high frequency transformers(c) high voltage side of small capacity transformers(d) high voltage side of high kVA rating transformersAnswer: a71. Harmonics in transformer result in(a) increased core losses(b) increased I2R losses(c) magnetic interference with communication circuits(d) all of the aboveAnswer: d72. The core used in high frequency transformer is usually(a) copper core(b) cost iron core(c) air core(d) mild steel coreAnswer: c73. The full-load copper loss of a transformer is 1600 W. At half-load, the copper loss will be(a) 6400 W(b) 1600 W(c) 800 W(d) 400 WAnswer: d1.74. The value of flux involved m the e.m.f. equation of a transformer is(a) average value(b) r.m.s. value(c) maximum value(d) instantaneous valueAnswer: cL.75. Silicon steel used in laminations mainly reduces(a) hysteresis loss(b) eddy current losses(c) copper losses(d) all of the aboveAnswer: a76. Which winding of the transformer has less cross-sectional area ?(a) Primary winding(b) Secondary winding(c) Low voltage winding(d) High voltage windingAnswer: d77. Power transformers are generally designed to have maximum efficiency around(a) no-load(b) half-load(c) near full-load(d) 10% overloadAnswer: c.78. Which of the following is the main advantage of an auto-transformer over a two winding transformer ?(a) Hysteresis losses are reduced(b) Saving in winding material(c) Copper losses are negligible(d) Eddy losses are totally eliminatedAnswer: b79. During short circuit test iron losses are negligible because(a) the current on secondary side is negligible(b) the voltage on secondary side does not vary(c) the voltage applied on primary side is low(d) full-load current is not supplied to the transformerAnswer: c80. Two transformers are connected in parallel. These transformers do not have equal percentage impedance. This is likely to result in(a) short-circuiting of the secondaries(b) power factor of one of the transformers is leading while that of the other lagging(c) transformers having higher copper losses will have negligible core losses(d) loading of the transformers not in proportion to their kVA ratingsAnswer: d81. The changes in volume of transformer cooling oil due to variation of atmospheric temperature during day andnight is taken care of by which part of transformer(a) Conservator(b) Breather(c) Bushings(d) Buchholz relayAnswer: a82. An ideal transformer is one which has(a) no losses and magnetic leakage(b) interleaved primary and secondary windings(c) a common core for its primary and secondary windings(d) core of stainless steel and winding of pure copper metal(e) none of the aboveAnswer: a83. When a given transformer is run at its rated voltage but reduced frequency, its(a) flux density remains unaffected(b) iron losses are reduced(c) core flux density is reduced(d) core flux density is increasedAnswer: d84. In an actual transformer the iron loss remains practically constant from noload to fullload because(a) value of transformation ratio remains constant(b) permeability of transformer core remains constant(c) core flux remains practically constant(d) primary voltage remains constant(c) secondary voltage remains constantAnswer: c85. An ideal transformer will have maximum efficiency at a load such that(a) copper loss = iron loss(b) copper loss < iron loss(c) copper loss > iron loss(d) none of the aboveAnswer: a86. If the supply frequency to the transformer is increased,the iron loss will(a) not change(b) decrease(c) increase(d) any of the aboveAnswer: c87. Negative voltage regulation is indicative that the load is(a) capacitive only(b) inductive only(c) inductive or resistive(d) none of the aboveAnswer: a88. Iron loss of a transformer can be measured by(a) low power factor wattmeter(b) unity power factor wattmeter(c) frequency meter(d) any type of wattmeterAnswer: a89. When secondary of a current transformer is open-circuited its iron core will be(a) hot because of heavy iron losses taking place in it due to high flux density(b) hot because primary will carry heavy current(c) cool as there is no secondary current(d) none of above will happenAnswer: a90. The transformer laminations are insulated from each other by(a) mica strip(6) thin coat of varnish(c) paper(d) any of the aboveAnswer: b91. Which type of winding is used in 3phase shell-type transformer ?(a) Circular type(b) Sandwich type(c) Cylindrical type(d) Rectangular typeAnswer: b92. During open circuit test of a transformer(a) primary is supplied rated voltage(b) primary is supplied full-load current(c) primary is supplied current at reduced voltage(d) primary is supplied rated kVAAnswer: a93. Open circuit test on transformers is conducted to determine(a) hysteresis losses(b) copper losses(c) core losses(d) eddy current lossesAnswer: c94. Short circuit test on transformers is conducted to determine(a) hysteresis losses(b) copper losses(c) core losses(d) eddy current lossesAnswer: b95. For the parallel operation of single phase transformers it is necessary that they should have(a) same efficiency(b) same polarity(c) same kVA rating(d) same number of turns on the secondary side.Answer: b96. The transformer oil should have _____ volatility and _____ viscosity.(a) low,low(b) high,high(c) low,high(d) high,lowAnswer: a97. The function of breather in a transformer is(a) to provide oxygen inside the tank(b) to cool the coils during reduced load(c) to cool the transformer oil(d) to arrest flow of moisture when outside air enters the transformerAnswer: d98. The secondary winding of which of the following transformers is always kept closed ?(a) Step-up transformer(b) Step-down transformer(c) Potential transformer(d) Current transformerAnswer: d99. The size of a transformer core will depend on(a) frequency(b) area of the core(c) flux density of the core material(d) (a) and (b) bothAnswer: d100. N atural air coo ling is generally restricted for transformers up to(a) 1.5 MVA(b) 5 MVA(c) 15 MVA(d) 50 MVAAnswer: a101. A shell-type transformer has(a) high eddy current losses(b) reduced magnetic leakage(c) negligibly hysteresis losses(d) none of the aboveAnswer: b102. A transformer can have regulation closer to zero(a) on full-load(b) on overload(c) on leading power factor(d) on zero power factorAnswer: c103. A transformer transforms(a) voltage(b) current(c) current and voltage(d) powerAnswer: d104. Which of the following is not the standard voltage for power supply in India ?(a) llkV(b) 33kV(c) 66 kV(d) 122 kVAnswer: d105. Reduction in core losses and increase in permeability are obtained with transformer employing(a) core built-up of laminations of cold rolled grain oriented steel(b) core built-up of laminations of hot rolled sheet(c) either of the above(d) none of the aboveAnswer: a106. In a power or distribution transformer about 10 per cent end turns are heavily insulated(a) to withstand the high voltage drop due to line surge produced by the shunting capacitance of the end turns(b) to absorb the line surge voltage and save the winding of transformer from damage(c) to reflect the line surge and save the winding of a transformer from damage(d) none of the aboveAnswer: a107. For given applied voltage, with the increase in frequency of the applied voltage(a) eddy current loss will decrease(b) eddy current loss will increase(c) eddy current loss will remain unchanged(d) none of the aboveAnswer: c108. Losses which occur in rotating electric machines and do not occur in trans formers are(a) friction and windage losses(b) magnetic losses(c) hysteresis and eddy current losses(d) copper lossesAnswer: a109. In a given transformer for a given applied voltage, losses which remain constant irrespective of load changes are(a) hysteresis and eddy current losses(b) friction and windage losses(c) copper losses(d) none of the aboveAnswer: a110. Which of the following statements regarding an idel single-phase transformer having a turn ratio of 1 : 2 anddrawing a current of 10 A from 200 V A.C. supply is incorrect ?(a) Its secondary current is 5 A(b) Its secondary voltage is 400 V(c) Its rating is 2 kVA(d) Its secondary current is 20 A(e) It is a step-up transformerAnswer: d111. The secondary of a current transformer is always short-circuited under operating conditions because it(a) avoids core saturation and high voltage induction(b) is safe to human beings(c) protects the primary circuit(d) none of the aboveAnswer: a112. In a transformer the resistance between its primary and secondary should be(a) zero(b) 10 Q(c) 1000 Q(d) infinityAnswer: d113. A good voltage regulation of a transformer means(a) output voltage fluctuation from no load to full load is least(b) output voltage fluctuation with power factor is least(c) difference between primary and secondary voltage is least(d) difference between primary and secondary voltage is maximumAnswer: a114. For a transformer, operating at constant load current, maximum efficiency will occur at(a) 0.8 leading power factor(b) 0.8 lagging power factor(c) zero power factor(d) unity power factorAnswer: d115. Which of the following protection is normally not provided on small distribution transformers ?(a) Overfluxing protection(b) Buchholz relay(c) Overcurrent protection(d) All of the aboveAnswer: b116. Which of the following acts as a protection against high voltage surges due to lightning and switching ?(a) Horn gaps(b) Thermal overload relays(c) Breather(d) ConservatorAnswer: a117. The efficiency of two identical transformers under load conditions can be determined by(a) short-circuit test(b) back-to-back test(c) open circuit test(d) any of the aboveAnswer: b118. Which of the following insulating materials can withstand the highest temperature safely ?(a) Cellulose(b) Asbestos(c) Mica(d) Glass fibreAnswer: c119. Which of the following parts of a transformer is visible from outside ?(a) Bushings(b) Core(c) Primary winding(d) Secondary windingAnswer: a120. The noise produced by a transformer is termed as(a) zoom(b) hum(c) ringing(d) buzzAnswer: b121. Which of the following loss in a transformer is zero even at full load ?(a) Core loss(b) Friction loss(c) Eddy current loss(d) Hysteresis lossAnswer: b122. Which of the following is the most likely source of harmonics in a transformer ?(a) poor insulation(b) Overload(c) loose connections(d) Core saturationAnswer: d123. If a transformer is continuously operated the maximum temperature rise will occur in(a) core(b) windings(c) tank(d) any of the aboveAnswer: b124. The hum in a transformer is mainly attributed to(a) load changes(b) oil in the transformer(c) magnetostriction(d) mechanical vibrationsAnswer: c125. The maximum load that a power transformer can carry is limited by its(a) temperature rise(b) dielectric strength of oil(c) voltage ratio(d) copper lossAnswer: c126. The efficiency of a transformer, under heavy loads, is comparatively low because(a) copper loss becomes high in proportion to the output(b) iron loss is increased considerably(c) voltage drop both in primary and secondary becomes large(d) secondary output is much less as compared to primary inputAnswer: a127. An open-circuit test on a transformer is conducted primarily to measure(a) insulation resistance(b) copper loss(c) core loss(d) total loss(e) efficiency(f) none of the aboveAnswer: c128. A no-load test is performed on a transformer to determine(a) core loss(b) copper loss(c) efficiency(d) magnetising current(e) magnetising current and lossAns: e129. The voltage transformation ratio of a transformer is equal to the ratio of(a) primary turns to secondary turns(b) secondary current to primary current(c) secondary induced e.m.f. to primary induced e.m.f.(d) secondary terminal voltage to primary applied voltageAnswer: c130. Part of the transformer which is most subject to damage from overheating is(a) iron core(b) copper winding(c) winding insulation(d) frame or case(e) transformer tankAnswer: c136. If a transformer is switched on to a voltage more than the rated voltage(a) its power factor will deteriorate(b) its power factor will increase(c) its power factor will remain unaffected(d) its power factor will be zeroAnswer: a137. Auto-transformer makes effective saving on copper and copper losses, when its transformation ratio is(a) approximately equal to one(b) less than one(c) great than one(d) none of the aboveAnswer: a138. Minimum voltage regulation occurs when the power factor of the load is(a) unity(b) lagging(c) leading(d) zeroAnswer: c139. In a step-down transformer, there is a change of 15 A in the load current. This results in change of supply current of(a) less than 15 A(b) more than 15 A(c) 15 A(d) none of the aboveAnswer: a140. The efficiencies of transformers compared with that of electric motors of the same power are(a) about the same(6) much smaller(c) much higher(d) somewhat smaller(e) none of the aboveAnswer: cTRANSFORMERS Questions and Answers pdf :: AVery small as compared to speed of light BEqual to speed of light CAlmost equal to speed of light DGreater than speed of light AElectrons only BPositive ions only CElectrons and positive ions DElectrons, positive ions, negative ions ASame current passes in turn through both BBoth carry the same value of current CTotal current equals to the sum of branch current DSum of IR drops equals to the applied e.m.f AMetallic resistor BCarbon resistor CWire wound resistor DVariable resistor AEqual to the atomic number of an atom BEqual to the charge of an electron CEqual to the charge of number of electron in an atom DZero AA galvanometer with low resistance in parallel is a voltmeter BA galvanometer with high resistance in parallel is a voltmeter CA galvanometer with low resistance in series is an ammeter DA galvanometer with high resistance in series is an ammeter ASlightly less than 125 W BSlightly greater than 125 W CExactly 125 W D250 W ALength of heating elements should be decreased BLength of heating element should be increased CLength of heating element has no effect on heating of water DNone of the above ATemperature of material is decreased BTemperature of material is increased CNumber of free electros available becomes more DNone of the above is correct ACollisions between conduction electrons and atoms BThe release of conduction electrons from the parent atom CMutual collision between metal atom DMutual collision between conducting electron AAny electrons from the orbit BFirst electrons from the orbit CSecond electron from the orbit DThird electron from the orbit Enjoy sharper detail, more accurate color, lifelike lighting, believable backgrounds, and more with our new model update. 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Your generated images will be more polished thanever.See What's NewExplore how consumers want to see climate stories told today, and what that means for yourvisuals.Download Our Latest VisualGPS ReportData-backed trends. Generative AI demos. Answers to your usage rights questions. Our original video podcast covers it allnow ondemand.Watch NowWhether youre looking for essay format examples or in-depth studies of literary works, our Writing Help section is at your disposal. Thats not all, you can also get instant feedback, citation help, and plagiarism checks for your academic paper with our online writing tool.Electron flow-powered mechanical deviceAn electric machine separated into its moving portion (rotor) and its stationary portion (stator and base). Pictured, and AC induction motor.In electrical engineering, an electric machine is a general term for a machine that makes use of electromagnetic forces and their interactions with voltages, currents, and movement, such as motors and generators. They are electromechanical energy converters, converting between electricity and motion. The moving parts in a machine can be rotating (rotating machines) or linear (linear machines). While transformers are occasionally called "static electric machines",[1] they do not have moving parts and are more accurately described as electrical devices "closely related" to electrical machines.[2]Electric machines, in the form of synchronous and induction generators, produce about 95% of all electric power on Earth (as of early 2020s). In the form of electric motors, they consume approximately 60% of all electric power produced. Electric machines were developed in the mid 19th century and since have become a significant component of electric infrastructure. Developing more efficient electric machine technology is crucial to global conservation, green energy, and alternative energy strategy.Faraday's electromagnetic experiment, demonstrating the conversion of electrical energy into motionThe basis for electric machines date back to the early 19th century, and the research and experiments of Michael Faraday in the relationship of electricity and magnetism.[3] One of the first demonstrations of an electric machine was in 1821, with a free-hanging wire dipped into a pool of mercury, on which a permanent magnet (PM) was placed. When a current was passed through the wire, the wire rotated around the magnet, showing that the current gave rise to a close circular magnetic field around the wire.[4] While primitive compared to modern electric machines, this experiment showed the ability to convert electric energy to motion.Improvements to electric machines continued throughout the 19th century, however as this predated the existence of an electric power system, they struggled to gain viability and acceptance.[5] Near the end of the 19th century, when the first electric grids came into existence, electric machines grew into more applications. Of note, the invention of the dynamo by Werner von Siemens in 1867 and invention of the first practical DC motor by Frank Sprague in 1886.[6]As electric power systems moved from DC to AC during the war of currents, so did electric machines. While alternators began to replace dynamos, AC motors proved more difficult. It wasn't until Nikola Tesla's invention of the induction motor that AC motors began to replace DC motors in significant quantities.[7]The main operating principles of electric machines take advantage of the relationship between electricity and magnetism, specifically that changes in one can create changes in the other.[8] For example, moving a bar magnet around a wire to induce a voltage across it, or running current through a wire in a magnetic field to generate a force. This is largely based off of Maxwell's Equations and can be analytically and mathematically complex. However, most electric machines are governed by the same 4 principles:[9]The Lorentz Force, a force generated due to current flowing in a magnetic fieldFaraday's Law of Induction, a voltage induced due to movement within a magnetic fieldKirchhoff's Voltage Law (KVL), the sum of voltages around a loop is zeroNewton's Laws of Motion, an applied force on an object is equal to its mass by its accelerationAs current flows within a magnetic field, a force is induced that causes movement. With this movement also within the magnetic field, a voltage is induced in the machine. This induced voltage affects the current in the machine, which in turn affects the force and speed, and ultimately the induced voltage again. This feedback tends to drive the machine to an equilibrium so that the electrical energy and mechanical energy are matched (plus losses). With proper orientation of magnetic fields, wires, voltages, and currents, an electric machine can convert electric energy (electricity) to mechanical energy (motion) and vice-versa.Electric machines typically separate their moving and non-moving portions and identify them uniquely. In rotating machines, the stationary portion is called the stator, while the rotating portion is the rotor. The stator and rotor may having windings (wire wound around them) to carry the current on the electrical side and/or to help create the magnetic field. The current carrying winding is called the armature winding while the magnetic field winding is called the field winding. All rotating machines have armature windings, but not all machines have field windings: the magnetic field can be created by a permanent magnet or an electromagnet created by the field winding. The armature winding and field winding (if applicable) can be on either the stator or rotor, depending on the machine design, however they are rarely on the same part.While electric machines have their differences, they share many traits, and are often grouped by some part of their construction or intended operation.[10] Below are some of the characteristics common to most electric machines.If an electric machine converts mechanical energy into electrical energy, it is referred to as a generator, while machines that are convert electricity to motion are called motors.[11]Generators that produce alternating current (AC) are called alternators, while direct current (DC) generators are called dynamos. Motors are referred to as pumps when their motion is used to move a fluid, such as water.[12]Theoretically, most electric machines can be used as either a generator or a motor, however in practice it is common for machines to be specialized to one or the other. Generator's power is typically rated in kilowatts (kW) while motors are rated in terms of horsepower (hp).Electric machines can be connected to either an AC or DC electrical system, with the AC being either single phase or three phase. With rare exceptions, such as universal motors, machines cannot switch between electric systems.[13] AC machines are largely either synchronous generators or induction motors.A DC machine is somewhat of a misnomer, as all DC machines use alternating voltages and currents to operate.[14] Most DC machines include a commutator, which allows the armature windings within the DC machine to periodically change their connections to the DC electrical system as the machine rotates, effectively alternating the direction of voltages and currents within the machine, but keeping DC voltages and currents on the electrical side.If an electric machine has an electric circuit on its rotor, it needs a means to power the circuit even while the rotor is rotating. One method of doing this is to attach metallic brushes to the stator and have them held under tension against the rotor.[15] These brushes are then energized on the stationary stator side, and transfer electricity to the moving rotor. The part of the rotor that contacts the brushes are called slip rings, and are designed to withstand both the electricity being passed through them and the mechanical wear of continuously spinning against the brushes. The brushes are generally made of carbon, for its strength and conductivity. Brushes wear down and need replacing throughout the life of the machine.Another technique to power the electric circuit on the rotor is through electromagnetic induction. As the rotor is already moving, it meets one of the main requirements of induction (varying magnetic field), and can be adapted to have a magnetic field induced into it. This technique is very common for induction motors, but is also used in bushless synchronous machines.[16]If the winding on the rotor is a field winding, its purpose it to act as an electromagnet and generate a magnetic field that rotates. This can be replaced with a permanent magnet, removing the need for brushes or slip rings and simplifies the design of the machine. Large permanent magnetics are expensive and do not always allow for a machine to act as both a motor and generator, so PM machines tend to be limited to small power motors.[17]Electric motors convert electricity to motion, and are able to move increasing larger mechanical loads by drawing more electrical energy. This comes at a cost: with the Lorenz Force defining the speed of the machine, if the force has to overcome a larger mechanical load, the speed of the machine slows down. In rotating motors, the forces are viewed as torques, and this behavior is referred to as the speed-torque curve of the machine.[18] Electric motors denote speed in terms of revolutions per minute (RPM).The shape of the speed-torque curve depends on the design of the motor. In DC motors, the speed-torque curve is linear, with maximum torque occurring with zero speed (stall torque) and maximum speed occurring at zero torque (no-load speed).[19] In AC motors, the torque-speed curve is a more complex shape, beginning at the starting torque associated with the locked-rotor current at no speed, gradually increasing with speed until peaking at the breakdown torque, and finally rapidly falling to zero at the no-load (max) speed. The exact shape of the curve depends on the AC motor design. In AC electric machines, one magnetic field rotates around the machine due to the electrical system connections, while the other magnetic field rotates due to the rotor's physical motion. If these two magnetic fields rotate at the same speed, the machine is said to be a synchronous machine, and operates at synchronous speed.[20] If the magnetic fields rotate at different speeds the machine is asynchronous, with a speed either above or below synchronous speed. If the rotors field is slower than the stator field, the machine acts as a motor, if it is faster it acts as a generator. Asynchronous machines cannot operate at synchronous speeds.[21] Another common name for asynchronous machines is induction machines.DC machines are not classified as either synchronous or asynchronous, as the magnetic fields do not rotate.[22] The magnetic field from the field winding (or PM) is on the stator and is stationary. The armature winding is on the rotor and rotates, but has its polarity reversed by commutation. The DC system also lacks a frequency to compare the speed to.While there are many different types of electric machines, a few different machine configurations account for the most common electric machines.Main article: Synchronous generatorA synchronous generator, with stator and rotor casings removedA synchronous generator is a synchronous machine with a prime mover attached to its rotor, which is driven by a steam or gas turbine. A synchronous generator typically has a three phase armature winding, and generators AC power. The rotor's field winding is typically excited through brushes and slip rings, however brushless machines are possible through either PM or an exciter circuit consisting of AC induction from stator to rotor and a rectifier on the rotor to provide DC power. They range in sizes from a few kilowatts at residential voltages up to 500 MW and greater at voltages above 20,000 V. Synchronous generators are the most common form of traditional generation for the AC power system.Main article: Induction motorA disassembled induction motor. From left to right: Stator, rotor, end capInduction motors are the most common type of motor used, and almost the only motor used in AC applications. It's popularity comes from its simplicity: by leveraging induction between the stator and rotor to generate the field winding's magnetic field, it removes the need for brushes, slip rings, or complex circuits, making it simpler and more rugged. The squirrel cage rotor design is the most common, however traditional wound rotors exist. Induction motors are available in three phase or single phase, although single phase induction motors cannot self-start, and require some type of starting circuit. Induction motors are both common in applications such as compressors for air conditioners and refrigerators, large fans and pumps, and conveyor systems.Main article: Brushed DC electric motorDC motor with permanent magnet excitor, with brushes commutators on the far right of the rotorSmall motors below 100 V are generally a type of brushed DC motor. They can be excited in a number of ways, either through a permanent magnet, a separate field winding circuit, or a field winding connected to the armature circuit. In all cases, the excitation circuit or magnets are on the stator, and the armature on the rotor with a commutator to connect to the electric circuits through brushes. Typical applications of brushed DC motors include small servo motors, small fans, and most battery power motors.Main article: Brushless DC electric motorSmall computer fan using a BLDC, with rotor on the left and stator on the right.The rotor contains a circular PM, and surrounds the statorA brushless DC Motor (BLDC) is a machine that replaces the brushes and commutators of a traditional, brushed DC motor with electronics to control the motor. The construction of a BLDC can be very similar to a permanent magnet synchronous machine, or it can be an adapted asynchronous machine. Smaller motors can also used unique stator and rotor arrangements, for example an outrunner configuration (with the rotor surrounding the stator) or an axial configuration (flat rotor and stator and in parallel in the same axis). In all cases, the motor is controlled by a set of electronics which energize different armature windings at different times, causing the PM on the rotor to rotate to a location or speed set by the electronics. Common BLDC motor applications include computer peripherals, such as disk drives and fans, and battery powered hand-held tools, such as drills and circular saws.Other electromagnetic machines include the Amplidyne, Synchro, Metadyne, Eddy current clutch, Eddy current brake, Eddy current dynamometer, Hysteresis dynamometer, Rotary converter, and Ward Leonard set. A rotary converter is a combination of machines that act as a mechanical rectifier, inverter or frequency converter. The Ward Leonard set is a combination of machines used to provide speed control. Other machine combinations include the Kraemer and Scherbius systems.Electromagnetic-rotor machines are machines having some kind of electric current in the rotor which creates a magnetic field which interacts with the stator windings. The rotor current can be the internal current in a permanent magnet (PM machine), a current supplied to the rotor through brushes (Brushed machine) or a current set up in closed rotor windings by a varying magnetic field (Induction machine).PM machines have permanent magnets in the rotor which set up a magnetic field. The magnetomotive force in a PM (caused by orbiting electrons with aligned spin) is generally much higher than what is possible in a copper coil. The copper coil can, however, be filled with a ferromagnetic material, which gives the coil much lower magnetic reluctance. Still the magnetic field created by modern PMs (Neodymium magnets) is stronger, which means that PM machines have a better torque/volume and torque/weight ratio than machines with rotor coils under continuous operation. This may change with introduction of superconductors in rotor.Since the permanent magnets in a PM machine already introduce considerable magnetic reluctance, then the reluctance in the air gap and coils are less important. This gives considerable freedom when designing PM machines.It is usually possible to overload electric machines for a short time until the current in the coils heats parts of the machine to a temperature which cause damage. PM machines can less tolerate such overload, because too high current in the coils can create a magnetic field strong enough to demagnetise the magnets.Reluctance machines have no windings on the rotor, only a ferromagnetic material shaped so that "electromagnets" in stator can "grab" the teeth in rotor and advance it a little. The electromagnets are then turned off, while another set of electromagnets is turned on to move rotor further. Another name is step motor, and it is suited for low speed and accurate position control. Reluctance machines can be supplied with permanent magnets in the stator to improve performance. The "electromagnet" is then "turned off" by sending a negative current in the coil. When the current is positive the magnet and the current cooperate to create a stronger magnetic field which will improve the reluctance machine's maximum torque without increasing the currents maximum absolute value.The armature of polyphase electric machines includes multiple windings powered by the AC currents offset one from another by equal phasor angles. The most popular are the 3 phase machines, where the windings are (electrically) 120 apart.[23]The 3-phase machines have major advantages of the single-phase ones:[24]steady state torque is constant, leading to less vibration and longer service life (the instantaneous torque of a single-phase motor pulsates with the cycle)power is constant (the power consumption of the single-phase motor varies over the cycle);smaller size (and thus lower cost) for the same power;the transmission over 3 wires need only 3/4 of the metal for the wires that would be required for a two-wire single-phase transmission line for the same power;better power factor.In electrostatic machines, torque is created by attraction or repulsion of electric charge in rotor and stator.Electrostatic generators generate electricity by building up electric charge. Early types were friction machines, later ones were influence machines that worked by electrostatic induction. The Van de Graaff generator is an electrostatic generator still used in research today.Homopolar machines are true DC machines where current is supplied to a spinning wheel through brushes. The wheel is inserted in a magnetic field, and torque is created as the current travels from the edge to the centre of the wheel through the magnetic field.While electric machines can be directly connected to electrical and mechanical systems, this is not without drawbacks. While the feedback of electric machines will balance electrical and mechanical energy, it will not protect the machine from overloads on either side. Other applications of machines also benefit from constant speed or power, which require control beyond the normal operation of a machine.As generators are used to create electrical systems, they are often controlled to keep the electrical system stable. To match the electrical demand, generators use a device called a governor to match the mechanical energy with the electrical load, typically by regulating the fuel source. As Synchronous generators create an electrical frequency based on their speed, they also include droop-speed control to keep their speed within an acceptable range for the electrical system. Generators can have switches or circuit breakers on their electrical side to connect and disconnect them, and can be controlled locally and/or remotely.Motors can be controlled with a simple manually operated switch or a complex electromagnetic system. One common means of controlling motors is with an electrical contactor who's coil is energized through a separate circuit. The circuit can be feed from the same power supply as the motor, but isolated through a transformer, separating the motors load current from the control current. Other devices like interlocks, latches, and time-delay switches can be combined in a ladder-logic arrangement to design different motor control schemes. Modern design can replace the electromechanical control logic with programmable logic controllers or variable frequency drives to offer more fine control of the motor, as well as remote access.Electric machine protection can be divided into the two parts of the machine: electrical protection and mechanical protection.On the electrical side, overcurrent protection is the most common and basic means of preventing the machine's windings and circuits from being damaged or destroyed. Complex machines with multiple windings and/or phases can also have differential protection, to ensure there is no fault within the machine. Machines can also include thermal protection (temperature of the windings), undervoltage, and phase-sequence detection, depending on the application. Protection can be simple with fuses and overload relays or more complex with circuit breakers and digital relays performing digital signal processing and protective functions.On the mechanical side, thermal protection monitors if the mechanical load is causing to much heat from friction. The bearings of the rotor can also be monitored indirectly, as damage and wear to them tend to cause increased noise and vibration in the machine. To monitor rotation speed, a tachometer can be used to measure the speed of the shaft.Most electrical machines are complex to analyze, however a simple Linear DC machine can be used to see how the operating principles relate. The electric circuit is made up of a battery V B {\displaystyle V_{B}} , a resistor R {\displaystyle R} , a switch S {\displaystyle S} , and two wires. The wires extend out and lie in a constant magnetic field B {\displaystyle {\vec {B}}} and have a small bar of length l {\displaystyle l} laying across them that is able to move freely.

has equal voltage to either end of the transformer winding. ceramic resonatorA piezoelectric element used to stabilize the frequency of an oscillator.channelAny communication path between a signal transmitter and a signal receiver, or, a pre-selected operating frequency for a radio system.channel capacityAn upper bound on the rate at which information can be reliably transmitted over a communication channel.charactronA kind of text display vacuum tube that used an internal element to shape an electron beam to represent the shape of letters and other symbols.charge pumpA DC to DC converter circuit that uses capacitors to store energy between stages. charge transfer switchA kind of charge pump circuit. charge-coupled deviceAn imaging sensor or data storage device that represents a signal, or pixel, by the charge stored in a capacitor and is able to move that charge from one capacitor to the next.Chebyshev filterA form of filter that has a steep frequency selective characteristic.chokeAn induction coil used to block alternating current and pass direct current, or to block high frequencies and pass lower frequencies.chopperA circuit that switches on and off at a high rate, used either for power conversion or to convert a DC signal to a more easily processed AC signal.circle diagramA representation of the voltage and current characteristics of an electrical machine; the plot traces out a circle or part of a circle.circuit breaker panelA distribution board for electric power that uses circuit breakers as protective elements.circuit breakerAn automatically operated electrical switch that opens to interrupt a short circuit or other fault.circuit theoryThe mathematical theory of electrical circuits.Circuit Total Limitation (CTL)A US National Electrical Code rule for the number of circuits in a panel board.clamp meterAn ammeter that measures current with a split core that can be clamped on a wire.Clapp oscillatorAn electronic oscillator circuit that uses three capacitors and an inductor.class of accuracy in electrical measurementsA measure of the error produced by an electrical measuring instrument.closed-loop controllerAny controller that manipulates some process variable to minimize the difference between the current state of the variable and the desired set point, such as temperature, flow, or others.CMOSComplementary metaloxidesemiconductor, a fabrication process for MOSFETs and integrated circuitscoaxial cableA cable with an inner conductor centered inside a flexible tubular conductor, used for radio frequency transmission lines.CockcroftWalton generatorA kind of circuit for generating very high DC voltage.cogenerationProduction of electricity along with some other desired product, such as process steam or desalinated water.cold cathodeAn element of a vacuum tube that emits electrons without a heating circuit.ColossusA British code breaking system used during World War II.combined cycleA thermal power plant that improves efficiency with two different kinds of energy extraction from the combustion products gas stream, such as a gas turbine followed by a steam boiler.communication systemA system intended to convey information from one place to another with an expected degree of performance.communications satelliteA satellite in Earth orbit designed for international telephone, television, or data transmission.commutation cellThe elementary switching device in a power converter circuit; it could be a transistor, a thyristor, a mercury-arc valve, or others. commutatorA component of a DC electric machine that connects the rotating coils with an external circuit through brushes. compact fluorescent lampA fluorescent lamp with a folded or spiral tube, designed to fit in the same space as an incandescent lamp of similar light output.CompactronA brand of vacuum tube, used in some radio and television sets, that combined multiple independent functions in one envelope.compensation windingA winding on a motor or generator to improve commutation at heavy load. computed tomographyProduction of images of a cross-section through an object by multiple X-ray measurements processed in a computer.computer engineeringThe profession of designing computers.computer hardwareThat part of a computer system with physical existence.computer programmingThe practice of producing instructions for a computer to achieve some desired effect.computer-aided design (CAD)A design discipline where a computer is used to produce graphical representation of the design or to assist in calculating performance parameters.conduction bandIn a conductor, the energy levels of charge carriers that are free to move through the material.constant k filterA method formerly used for designing filters for a required characteristic.consumer electronicsElectronic devices intended to be owned by consumers directly; a mobile cell phone is "consumer electronics" but the cell site it communicates with is not.contactorAn automatically controlled electrical switch (relay), used to operate motors or other high-current loads.continuous Fourier transformA mathematical operation that expresses a signal in time as the sum of its frequency components.continuous signalA signal that can take any value within its range.control engineeringThe application of control theory to practical problems.control systemThe equipment used to adjust some parameter of an ongoing process to regulate its behavior to a desired goal, such as positioning a disk drive head or regulating temperature of a furnace.control theoryThe mathematical study of behavior of control systems.controllabilityIn control theory, the degree to which a system can be put into any desired state given manipulation of one variable.controllerA system that adjusts some variable to control a process.copper cable certificationThe process of testing a computer network cable installation to verify that it meets standards.copper lossThat portion of an electric machine or transformer's loss attributed to the resistance of conductors (which are not necessarily made of copper). corona ringA component of a high-voltage system intended to smooth out the electric field distribution around energized parts.coulombThe SI unit of electric charge.Coulomb's lawThe mathematical relation between force, electric charge and distance.CPUCentral Processing Unit, the element of a computer that carries out arithmetic and logic operations.crest factorThe ratio of peak to effective (RMS) value of a waveform.crossed-field amplifierA type of microwave amplifier vacuum tube.crosstalkObjectionable presence of a signal from one circuit in another circuit sharing the same transmission path, such as a cable.crystal oscillatorAn electronic oscillator whose frequency is stabilized by a piezoelectric crystal resonator element.uk converterOne kind of buck-boost voltage converter that uses a capacitor as an energy storage element. currentThe movement of electric charge.current densityThe current flowing per unit area of a conductor.current source inverterA type of power inverter where an inductor tends to keep a constant current flowing in the inverter stage.current sourceIn circuit theory, an element that produces a defined current independent of the connected circuit properties.current transformerAn instrument transformer used for measuring current in AC power systems.current-to-voltage converterA transducer that produces an output voltage in response to an input current.cyberneticsThe science of automatic control systems.cycloconverterA type of variable-frequency power converter that does not first convert AC to DC.damping ratioA parameter that indicates how rapidly oscillations in a system die out, if ever.Darlington transistorAn interconnection of two transistors to provide a gain that is the product of the individual gains.data compressionAny technique that allows information to be transmitted more compactly than originally expressed, for example, codes.data networksA network for interconnection of computers and peripherals.DC injection brakingA method of slowing an AC electric motor by passing direct current through its windings.DC-to-DC converterA circuit that takes power from a DC source and generates a different DC voltage.degaussingThe process of reducing the residual magnetic field in a metallic object, such as a ship.delay lineA circuit component that introduces a delay in a signal.delta-wye transformerOne type of connection of a three-phase transformer. demand factorThe fraction of actual use of some quantity, related to the maximum that could be used in a specified time.demand responseThe ability of a generating station or grid to follow changes in load while maintaining voltage and frequency within acceptable limits.demodulationThe process of recovery of information (sound, video, data) from a modulated carrier.describing functionA method for analyzing non-linear control systems.detectorA circuit that demodulates a radio signal to recover information.DIACA four-layer semiconductor diode that has a predictable breakdown characteristic.dielectricA material that does not allow free flow of electric current.digital audio broadcastingTransmission of sound by digital signals over radio.digital circuitA circuit where all points on the signal path have only one of two states.digital computersA computer made of digital circuits.digital controlA control system that processes signals in digital form.digital filterA filter implemented as a digital circuit.digital image processingManipulation of an image by a digital computer.digital micromirror deviceAn element of a kind of digital projector system.digital protective relayA power system protection device that processes signals in digital form.digital signal controllerA type of microprocessor that combines a digital signal processor element with a more general purpose microcontroller.digital signal processingThe technique of modifying the properties of a signal that has been converted to digital form.digital televisionTransmission of images using digital techniques.digital-to-analog converterA device that produces a voltage or current that is proportional to a digital value sent to it.diode bridgeAn interconnection of diodes to rectify alternating current to direct current.diodeA two-terminal passive circuit element, with a preferred direction of current flow.dipole antennaA simple form of antenna that consists of two conductors oriented end-to-end with a feed in between them.direct current (DC)Electric current that flows in one direction only.direct on line starterA kind of motor starter that does not reduce the voltage at the motor terminals.direct torque controlA method of estimating motor torque as part of a variable speed motor drive.discrete cosine transformA mathematical technique for representing a sampled signal as a sum of cosine waves of different frequencies.discrete Fourier transformA mathematical technique for representing a sampled signal as a sum of sine and cosine waves of different frequencies.discrete-time signalA signal represented as a time series of samples taken at regular intervals.displacement currentThe effect of a time-varying electric field, which induces a magnetic field just as the motion of electrical charges does.display deviceAny device that displays data from an information system, such as a watch readout or an automatic scoreboard.dissipationThe loss of energy in a system, such as dielectric loss in a capacitor.dissolved gas analysisA technique for fault detection in oil-filled transformers. distributed control systemA control system in which significant parts of the control process are decentralized.distributed-element modelAn analysis of an electric circuit where capacitance, inductance, and resistance are distributed along the circuit, as in a transmission line, not concentrated in lumped components.distributed generationAn electrical grid where multiple small sources contribute energy, instead of relatively few large central generating stations.distribution boardA piece of electrical switchgear which distributes electric power to multiple branch circuits.distribution transformerA power transformer, usually used to change the utility distribution voltage to a lower voltage for use on the customer premises. DolbyA trademark for a noise reduction technique for analog sound recordings.dot conventionA system for marking terminals on instrument transformers to maintain correct polarity.doubly fed electric machineAn electric machine where both moving and stationary elements have external connections handling significant power.downsamplingA technique for reducing the number of signal samples processed by a digital system; decimation.Dqo transformationA technique used to simplify mathematical analysis of polyphase electric circuits.droop speed controlA method of regulating generators so that multiple units share the load proportional to their ratings.dual control theoryA branch of control theory that deals with systems whose characteristics are initially unknown.dual loopA method of supervising contacts and wiring in a security system, so as to detect some faults or tampering.DVDDigital Versatile Disc, a type of optical disc for distributing video recordings and data using an orange/red laser.dynamic brakingA braking system that extracts energy from a moving system to bring it to rest; a dynamic braking system generally is not used to hold a position of a stationary object.dynamic demandA technique for load management on an electrical grid based on frequency measurement.dynamic programmingA technique for optimization of the solution of a problem by combining solutions to smaller sub-problems.dynamic random-access memoryA type of semiconductor memory where data is stored as electric charges on capacitors; the charges must be refreshed periodically or else they will leak away, losing the stored data.dynamoA direct-current generator, whose exciting field is provided by an electromagnet.Earth leakage circuit breakerA protective device that opens a circuit when stray voltage or current is detected that would present a hazard of electric shock.eddy currentAn electric current induced inside a conductor exposed to a changing magnetic field.edge detectionAn image processing technique used to identify boundaries of objects.Edison effectThe emission of an electric current from a hot wire; Edison did not realize he'd discovered the fundamental mechanism of the vacuum tube, thermionic emission.electretA dielectric material that permanently retains an impressed electric field; the dual to a magnet.electric arcDischarge of electric current through an open space between conductors; may be produced intentionally as a source of intense light and heat, or may be a result of an electrical fault.electric chargeThe physical property of matter that causes it to experience a force when placed in an electromagnetic field.electric circuitA closed path through which an electric current can flow.electric currentThe motion of electric charges.electric displacement fieldIn Maxwell's equations, a vector field due to electric charges.electric distribution systemsThat portion of an electrical grid that connects customers to substations or the bulk transmission system.electric field gradientThe rate of change of electric field with respect to distance.electric fieldA vector field that exerts a force on electric charges.electric generatorA machine that converts mechanical energy to electrical energy by moving conductors through magnetic fields.electric motorA machine that produces mechanical energy from electrical energy, by moving conductors through magnetic fields.electric multiple unitUse of more than one electric locomotive on a train.electric potentialA measure of the work required to move a unit electric charge in an electric field.electric power conversionGenerally, changing the form of electric power.electric power distributionIn an electric grid, the network that brings power from a substation or bulk supply to individual customers.Electric Power Research InstituteA non-profit organization that carries out research on behalf of the US electric power industry.electric power transmissionThe bulk movement of electric power for many customers from a generating plant to a local distribution network, usually at high voltage.electric powerThe rate of transfer of electrical energy past a given point.electric shockAn injury caused to people or animals by electric current.electrical cableA flexible conducting wire to carry electrical power or signals, usually covered with an insulating material.electrical codeA set of regulations for the use of electricity; they may vary from municipal to international in scope.electrical conductivityA measure of a substance's ability to pass an electric current.electrical conductorAn object that carries an electric current, with little loss.electrical contactA separable part of an electric device that carries current when touching another contact.electrical discharge machining (EDM)Shaping of a work place by small sparks.electrical elementIn circuit theory, a node at which some electrical property is concentrated (resistance, etc.).electrical engineeringThe profession of applying electricity to practical problems.electrical equipmentApparatus for generation, transmission or utilization of electric power.electrical gridA geographically distributed system to connect source and users of electric power.electrical impedanceThat property of a circuit that resists the passage of electric current, usually in the context of alternating current.electrical insulation paperA grade of paper used for insulation of transformers, electrical machines, capacitors, and some cables.electrical insulationA material that resists electrical current flow.electrical loadA consumer of electrical energy, turning it into light, heat, mechanical power, data, or chemical changes.electrical machineMotors and generators, apparatus that converts between electrical power and mechanical power.electrical measurementsThat branch of metrology concerned with electrical quantities.electrical networkA network of electrical components and conductors.electrical polarityIdentification of electrical terminals where current is flowing in the same direction relative to the device.electrical steelAny of several types of steel used for manufacturing the magnetic field components of machines and transformers.electrical substationA facility connecting a distribution network to a transmission network, usually with one or more transformers.electrical technologistA specialist in applying electrical theory and technique to practical problems.electrical wiring regulationsThe legal framework for electrical installations in buildings.electrical wiringThe installation of conductors, fixtures and protection devices for a structure or vehicle.electricity meterAn instrument to measure the electrical energy used by a customer for revenue purposes.electricity pylonA structure, generally of wood or metal, to support wires.electricityThe set of physical phenomena associated with electric charges.electrificationApplying electric power to a process that was previously done by other means, or, development of an electric power system in a region that previously had none.electroactive polymersA polymer that significantly changes size or shape when exposed to an electric field.electrocardiographA record of the electrical activity of the heart.electrochemical engineeringThe profession of application of electrochemistry to practical problems.electrodesAn electrical contact that connects some medium to an electric circuit, such as in an electrochemical cell or a vacuum tube.electro-diesel locomotiveA railway locomotive with a diesel engine, generator, and electric driving motors that can be powered by the diesel engine or the track electrical supply.electrodynamicsThe branch of physics that studies electrical charges and electrical currents.electrolyteA liquid or solid medium that carries electric current in the form of ions.electromagnetA magnet that generates a magnetic field from an electric current.electromagnetic compatibilityThe control of unwanted electromagnetic interference.electromagnetic fieldThe field produced by moving electric charges and magnetic fields.electromagnetic inductionThe production of current in a circuit by the change of magnetic field intersecting the circuit.electromagnetic radiationRadio waves, light and other radiation that travels through space at the speed of light.electromagnetic spectrumThe range of frequencies of electromagnetic radiation.electromagnetic wave equationA second-order partial differential equation that describes the propagation of electromagnetic waves through a medium or in a vacuum.electromagnetismThe science of electric fields, magnetic fields, currents, charges, and forces.electromechanicalA system that has both an electrical component and a mechanical component, such as a motor or a relay.electromoteAn 1882 demonstration of a prototype electric trolley bus.electromotive forceA difference in electrical potential between two points, such as produced by a battery or a generator.electron microscopeAn instrument that provides highly magnified images by use of an electron beam.electronic amplifierA device that increases the power of an electrical signal by electronic means.electronic circuitA circuit using one or more electronic devices.electronic componentAn active or passive element of an electronic circuit.electronic control unitIn an automobile, an embedded electronic system that controls some aspect of a vehicle (ignition, transmission, and so on).electronic design automationA system in which a computer provides assistance to the designer of a device or system.electronic engineeringThe profession of applying electronics to practical problems.electronic filterA filter that alters some frequency-related characteristic of a signal.electronicsThe study of the flow of electrons through a vacuum, gases or semiconductors.electronic speed controlA device for regulating the speed of a motor.electrophorusAn instrument used to produce electrostatic charge through electrostatic induction.electrostatic motorA motor that relies on the forces generated by electric fields, instead of magnetic fields.electrostaticsThe study of stationary electric charges and resulting forces.embedded operating systemThe common operating environment that supports embedded software; it may be a highly tailored version of a general-purpose operating system, or written solely for the purpose of embedded system operations.embedded softwareA firmware component of a microprocessor-controlled system.embedded systemA computer system that controls a device or system, with no or a minimal user interface; for example, the ignition system in a car may have a microprocessor to control it.enameled wireWire insulated with a thin flexible layer of enamel, used for electrical windings.energy demand managementA system to adjust energy demand to reduce costs.energy economicsA branch of economics concerned with energy supply and demand.energy efficient transformerA power transformer designed to have lower than average energy loss.energy returned on energy investedA measure of how long an energy producing system takes to replace the energy it took to make it.energy subsidiesPayments to a consumer or producer of electric energy that are used as incentives for production or consumption.engine-generatorA combination of an internal combustion engine and a generator, often used as a standby power plant.ENIACThe first general purpose electronic digital computer.Epstein frameAn apparatus used for testing of magnetic materials.equalization (audio)Adjustment of the frequency response of a system to improve its utility.equalization (communications)Adjustment of the frequency spectrum of a signal to cancel out the effect of the frequency response of a communication path.equivalent circuitIn circuit theory, a simple combination of elements that behaves at its terminals like a more complex combination.equivalent impedance transformsA mathematical method to determine values of an equivalent circuit.error correction and detectionTechniques used to improve reliability of computer memory or communications channels by including extra information along with the desired data.exponential stabilityA system that settles to a steady state after a disturbance, at a rate proportional to exponential time.extended Kalman filterA strategy for estimating an unknown value in a non-linear system by combining multiple measurements.faradThe SI unit of capacitance.Faraday shieldA solid conductive shield around a volume, which blocks electromagnetic fields.FaradayLenz lawOne of Maxwell's equations, describing the relation between a changing magnetic field and production of an electromotive force.Faraday's law of inductionThe relation between a changing magnetic field and the resulting voltage produced in a closed path.fast Fourier transformA digital algorithm to analyze a time series of sampled data into a set of sine and cosine frequency components.faultA short circuit, open circuit, or other disruption of a power system.faxFacsimile, the transmission of paper images by radio or by wire.feed forwardA control system that adjusts the controlled variable based on a model of the process and measurements of disturbances, instead of feedback from measurement of the process.feedback amplifierAn amplifier that feeds back a small sample of its output to its input, to improve linearity.feedbackA system that samples part of its output and adds that to its input; feedback may be either positive or negative, aiding or opposing the initial input signal.feed-in tariffA premium rate paid to distributed generators to encourage alternative energy sources.ferrite coreA magnetic core for an inductor made from a metal oxide compound.ferroelectricityThe property of materials that spontaneously maintain an electrical polarization, as a ferromagnetic material maintains magnetic polarization.fiber-optic cableA transmission medium that uses infrared energy or light to transmit information down a long thin transparent filament such as glass.field effect transistorA transistor that relies on modulation of conductivity of a channel instead of injection of minority carriers as does a bipolar transistor.field-oriented controlA control strategy for variable frequency drives that models the magnetic field of the motor to control its torque.filterA circuit that selectively alters a signal based on its frequency components.filter capacitorIn a power supply, a capacitor that smooths the DC voltage produced by a rectifier stage.finite impulse responseA class of digital filters whose response to an impulse returns to zero in finite time.firmwareSoftware of a computer that is never or rarely altered during its working life, for example, the control computer program for an automotive ignition system.Fleming valveThe first important vacuum tube device, used as a radio detector.Fleming's left-hand rule for motorsA mnemonic to recall the relative orientation of current, magnetic field and resulting force for electric motors.Fleming's right-hand rule for generatorsA mnemonic to recall the relative orientation of current, magnetic field and resulting force for electric generators.fluorescent lampA type of electric lamp that relies on a phosphor coating to produce visible light from the ultraviolet light generated by a mercury discharge.flux linkageIn a magnetic system, that part of the magnetic flux that passes through a given closed path, which may be a winding.flyback converterA type of voltage converter that stores energy in an inductor. flyback transformerA type of transformer that recovers energy stored in its own core. Historically used in the deflection circuits of CRT display systems.forward converterA type of voltage converter that relies on transformer action to couple energy to its output circuit.fossil-fuel phase-outA plan to replace coal, oil, or natural gas fuel with other sources to produce electrical energy.fossil-fuel power stationA power plant using coal, oil, or natural gas fuel.Fourier seriesA set of coefficients of sine and cosine waves; this can represent a time function as a function of frequency.Fourier transformAn algorithm for converting a continuous waveform in the time domain into an equivalent set of spectral components in the frequency domain.free space optical communicationsTransfer of information from point to point by a beam of light or infrared energy, instead of a wired connection or radio waves.frequency changerAn electric machine used to transfer power between two networks with different frequencies, or, an electronic device (more usually called a frequency mixer) that changes the frequency of an input signal to some other frequency. frequency modulationA method of impressing information on a carrier wave by changing its frequency.frequency responseThe measure of the output of a system in response to an input of varying frequency.full load currentThe current drawn by a motor or other electrical machine at its full rated power and standard voltage.full-wave rectifierA rectifier circuit that converts both positive and negative parts of the input alternating current waveform into a unidirectional, direct current.fuseA circuit protective device that interrupts excessive current by melting a metal strip.fuzzy controlA control system that relies on fuzzy logic instead of binary true/false conditions.gain schedulingA technique for control of non-linear systems that use different control parameters based on some measurement of the process controlled.galvanic corrosionElectrochemical corrosion of one metal in contact with another.galvanometerAn instrument for detecting small electric currents.gamma rayElectromagnetic radiation with wavelengths shorter than ten nanometres. Strictly: radiation that is produced in the nucleus of atoms.gas-filled tubeAn electron tube device that relies on the presence of gas for operation, usually at less than atmospheric pressure.gate turn-off thyristor (GTO)A four-layer power semiconductor device that can be turned on and off by signals at a control (gate) terminal.Gauss's lawA mathematical relation between the electric flux passing through a surface and the charge contained within that surface.generatorIn circuit theory, an ideal voltage source or an ideal current source, whose properties are independent of the connected circuit.governorA speed regulator for a machine such as a steam engine; an early important feedback control cybernetic system.grid energy storageAny system tied to an electrical grid that stores electrical energy at low demand times and releases it to meet peak loads; it might be a centralized station like a pumped-storage hydroelectric plant, or might be distributed over many customer sites such as by the use of electric vehicle batteries.grid-tie inverterA power inverter that allows synchronization with the electrical grid for export of energy surplus to the facility's needs.groundA reference point for electrical potential; often connected to the Earth.ground and neutralProtective and circuit return conductors in a wiring system.ground-level power supplyA system for providing powers for electric trams without overhead wires and without a permanently energized third rail.growlerA test instrument that is used to diagnose some faults with AC motors.GSMThe second generation of cellular mobile phone technology, deployed since 1991 in Europe.Gunn diodeA two-terminal solid-state device that is used in microwave oscillators.gyrotronA high-power vacuum tube oscillator that can produce microwave frequencies up to hundreds of gigahertz at power levels up to megawatts.H infinityAn optimization strategy for certain classes of control problems.Hall effect sensorA device that detects and measures magnetic field by the Hall effect voltage induced in a current-carrying semiconductor.harmonic distortionAn effect of a non-linear signal path that introduces frequencies that are integer multiples of an input frequency.harmonic oscillatorAn oscillator which produces sinusoidal output, such as a simple RLC oscillator.harmonicA waveform that has a frequency which is an integer multiple of another frequency.harmonicsDistortion of the power line voltage due to non-linear loads such as rectifiers.H-bridgeAn array of four controlled switches that coverts direct current to alternating current, with peak value equal to the supply voltage.HDTVHigh Definition Television, any television system with more than 625 scan lines.headphoneAn audio transducer or pair of transducers arranged to be worn on (or in) the ear.heat transferThe study of the flow of heat energy; heat transfer concerns dictate major design features of most electrical and electronic systems.heatsinkA structure intended to dissipate heat from an active device into the ambient environment.Heaviside step functionA mathematical unit step function useful in the solution of certain differential equations by the methods of operational calculus.Helmholtz coilAn arrangement of coils useful for producing a uniform magnetic field within a certain volume.henryThe SI unit of inductance.HertzThe SI unit of frequency, equivalent to one cycle per second.heterodyneThe process of mixing signals of a number of frequencies to produce new frequencies.heterostructureA semiconductor device built of two or more dissimilar materials.Hi-FiHigh Fidelity, the set of techniques for reproduction of sounds that appear natural in source.high-voltage cableA flexible insulated electrical conductor designed to withstand a significant voltage; "high" voltage may be hundreds or hundreds of thousands of volts, depending on the context.high voltageAny voltage at which safety concerns apply; in some contexts, anything over 100 volts may be a high voltage; in electric power transmission, voltages over 66,000 volts are considered "high voltage".high-pass filterAn electrical network that tends to pass higher frequencies and block lower ones.high-voltage direct currentA system for power transmission that uses high DC voltages for reasons of economy or stability. high-voltage switchgearElectrical apparatus designed for control of high-voltage circuits.Hilbert transformA mathematical operation used in signal processing. holographyThe technique of representing the image of a scene by a recording of interference patterns of the light field.home applianceAny electrical appliance intended for use in a home.homopolar generatorA generator in which current and magnetic field direction are constant as the machine rotor revolves.homopolar motorA motor that produces torque from a current and magnetic field that does not change direction.horsepowerA unit of power, equivalent to around 746 watts.hot wire barretterA current dependent resistor formed of a fine wire in an envelope, useful for regulating current.humidistatA switch that operates automatically on detecting a change in moisture content of the air.HVACHigh Voltage Alternating Current; depending on context, this could be hundreds or hundreds of thousands of volts.HVDC converter stationAn element of a high-voltage direct current power transmission system; each end of the transmission line has a converter station connected to the local AC grid.HVDCHigh Voltage Direct Current.hybrid coilA kind of transformer used for bidirectional transmission of signals over one pair of wires, for example, as in an analog telephone set.hydroelectricityThe generation of electric power from the kinetic energy of falling water.hydropowerPower (now nearly always electric power) generated from falling water; hydroelectricity.hysteresisA characteristic of a system where its state is history-dependent.IGBTInsulated Gate Bipolar Transistor, a power semiconductor device that combines some of the advantages of field-effect and bipolar transistors.image impedanceA parameter used in design of electrical networks such as filters.image noise reductionAny technique used to reduce interfering effects in processing of an image.image processingElectronic recording, storage, alteration and reproduction of pictures.impulse responseThe response of a network to a sudden narrow pulse input.incandescent light bulbA device that uses a fine wire filament heated by an electric current to make light...and heat.induction coilAn early name for a transformer; a type of transformer for high-voltage uses. induction cookerA cooking appliance that heats pots with magnetic fields.induction generatorA type of generator where the rotating field winding is excited by induction from the stationary armature winding.induction motorA type of motor where the rotating field winding is excited by induction from the stationary armature winding. inductive couplingTransfer of energy between two circuits through the magnetic field that passes through both.inductive output tubeA high power, high frequency amplifier tube, in some forms capable of megawatt pulses at hundreds of megahertz.inductorA circuit component with a concentrated inductance; a coil; stores energy in a magnetic field.industrial and multiphase power plugs and socketsElectrical fittings used to connect cables to three-phase power circuits.industrial automationThe general practice of automatic control applied to industrial operations.infinite impulse responseA filter which, mathematically, never gets to a zero effect of an impulse at its input, though practically the response may become negligible after a definite time.information appliianceConceptually, an embedded computer system with a specialized user interface designed to simplify one task, such as e-mail or photos; a modern smart phone approaches this concept.information theoryThe mathematical study of information.informationIn one sense, the answers to uncertainties.input/output (I/O)That part of a computer system devoted to exporting and importing data, for example, in human-readable form.inrush currentThe transient current that flows when first connecting a device to a power source.Institute of Electrical and Electronics Engineers (IEEE)The American-based society for electrotechnology.Institution of Engineering and TechnologyThe British society of electrical and electronics engineers.instrumentation engineeringThe profession dealing with development of measuring systems.instrumentationA device that turns some physical property into a measurement.insulation monitoring deviceA supervisory device to detect failure of electrical insulation.insulatorA substance that does not permit easy flow of electric current; a fitting intended to support a conductor.integrated circuitAn interconnected array of electronic devices, factory assembled on a single substrate.intelligent controlThe application of artificial intelligence techniques to process control.intelligent transportation systemThe application of information technology to manage some aspects of a transportation system.intermittent energy sourceAn energy source whose availability is not under human control; it may be sporadically available or available on some natural schedule not coincident with human demands; energy sources that are not dispatchable.International Electrotechnical Commission (IEC)An international standards organization devoted to electrical standards; most countries are members.International Organization for StandardizationAn international organization coordinating the efforts of national technical standards organizations.interrupterAny of a series of automatically operated electromechanical switches that periodically opened and closed a circuit.inverterA system that converts direct current power to alternating current, without the use of rotating machines, using electron devices such as mercury arc valves or thyristors.iron lossThat portion of the wasted power of a machine or transformer attributed to hysteresis and eddy currents in the iron core. isolated-phase busA bus where each phase is in its own grounded metal enclosure to prevent faults from spreading from phase to phase; often used in large power plant generators.isolation transformerA transformer especially intended to prevent leakage current from passing from its primary circuit to the secondary circuit.iterative learning controlA technique for improving the accuracy of control systems that carry out the same sequence repeatedly.j operatorElectrical engineering uses "j" to represent the imaginary unit "i", to prevent confusion with the symbol for current. $j j = 1$ {\displaystyle j\times j=-1} .Jedlik's dynamoAn early form of electric generator using electromagnets.JFETA field effect transistor with a reverse-biased PN junction between gate and channel.jitterDeviation from the true periodicity of a periodic signal.Joule heatingHeating in a conductor due to passage of current.jouleSymbol: J, is a derived unit of energy in the International System of Units.[1] It is equal to the energy transferred to (or work done on) an object when a force of one newton acts on that object in the direction of the force's motion through a distance of one metre (1 newton metre or Nm). It is also the energy dissipated as heat when an electric current of one ampere passes through a resistance of one ohm for one second. It is named after the English physicist James Prescott Joule (18181889).[2][3][4]Kalman filterAn algorithm for estimating an unknown value from a series of approximate measurements.KelvinStokes theoremA theorem in calculus, useful in analytic solutions of problems in electromagnetism.Kilovolt-ampereA unit of apparent power.Kirchhoff's circuit lawsThe observation that the sum of the currents at any node of a circuit must be zero, and the sum of the voltage differences around any loop must be zero; often abbreviated "KCL" and "KVL" in lecture notes.KlystronA type of microwave oscillator vacuum tube.Ladder networkA string of many, often equally dimensioned, impedances connected between two reference voltages.LANLocal Area Network, an interconnection of computers over a building or small campus.Laplace transformA mathematical operation for solution of differential equations by transforming them to the s domain from the time domain.laser diodeA semiconductor device that produces coherent laser radiation when properly energized.leakage inductanceThe inductance of a transformer that results from magnetic flux not linked by both primary and secondary windings. light-emitting diodeA semiconductor device that produces light or infrared or ultraviolet radiation when properly energized.linear alternatorAn electrical machine that generates electric power from the relative straight-line motion of its parts.linear motorAn electrical machine that generates electric force in a straight line by the interaction of its moving parts and magnetic fields.linear variable differential transformerA transducer that produces an electrical signal proportional to the movement between its parts.linemanA specialist technician who installs outside plant wiring (overhead circuits, power transmission lines).Litz wireA kind of stranded wire used to minimize losses in coils.load flow studyA mathematical prediction of the flow of electric power in a network, based on a model of the actual or proposed system; necessary for planning of electrical grids.load following power plantA power plant that can economically be operated over a significant range of output, so as to meet varying electric power demand.load-loss factorA factor for estimating energy lost in a distribution network due to load current.load managementAny strategy for altering the operation of customer loads so as to reduce peak demand on an electrical grid.load profileThe daily, weekly, or annual plot of electrical load against time.local positioning systemA navigation system that doesn't cover the whole Earth; such as over a continent, or even within a building.LORANA radio navigation system developed from a World War II military system (GEE), used for civilian purposes till the 1980s.Lorentz force lawThe mathematical relation between currents in conductors and the resulting magnetic forces between them.lossless data compressionAny data compression method where the source can be reconstructed exactly; where approximations are tolerable, lossy data compression can be used.lossy data compressionAny data compression method which allows only a close approximation of the source to be reconstructed; useful for images or music, where the human perceptual system compensates for the errors.loudspeakerA transducer that converts electrical current into sound, perceptible to more than one listener.low-noise amplifierIn a satellite radio receiving system, an amplifier placed near the antenna.low-noise block downconverterIn a satellite radio receiving system, a device that amplifies and converts signals to a lower frequency band that will have lower losses in interconnecting cables.low-pass filterAn electric filter network that passes lower frequencies and blocks higher ones.LTI system theoryThe theory of systems that, over a useful range, respond proportionally to inputs and don't change characteristics while responding.lumenThe SI unit of luminous flux, the energy of visible light.lumped parametersDescribes an electrical network where the circuit elements are small compared to the wavelengths of the signals passing through it.Lyapunov stabilityA criterion for stability of a dynamical system; if disturbances from a stable point reduce and the system returns to that stable point, it can be said to be Lyapunov stable.machine learningThe set of artificial intelligence techniques for systems that can follow examples to solve new problems. magnet wireThe class of wire manufactured for winding electromagnetic coils such as in motors or transformers. magnetic blowoutA component of a switching device that uses a magnetic field to assist in extinguishing the arc, using a permanent magnet or a coil.magnetic circuitA path through which magnetic flux passes.magnetic constantThe constant that relates the strength of magnetic flux to magnetic induction in free space.magnetic core memoryA type of computer memory that stores data as magnetization in tiny rings of ferrite material.magnetic fieldA field that causes magnets and currents to experience forces.magnetic flux densityThe amount of magnetic field per unit area; in SI units, measured in webers per square metre.magnetic fluxThe magnetic field; a conductor that encloses a changing magnetic flux will have a voltage induced in it.magnetic momentThe proportionality constant that relates the twisting torque produced on an object to the magnetic field.magnetismThe class of natural phenomena related to magnets and magnetic fields.magnetizationA property of a material that measures its response to a magnetic field.magnetization currentIn a transformer, that portion of the current used to support magnetic flux.magnetostaticsThe study of stationary magnetic fields.magnetostrictionA property of some materials that change shape when subject to a magnetic field.magnifying transmitterA concept for a signal transmitter that used a resonant transformer to provide a high voltage. main distribution frameIn a telephone central office, the equipment that connects to subscriber circuits.mainframe computerA large centralized computer system, used for large volumes of data or supporting multiple interactive terminals, with large input/output capacity, generally expected to provide critical services to a business or institution with a predictable degree of reliability.mains electricityCommercial electric power, purchased from an off-site source shared by many consumers. Regional supplies vary in voltage, frequency, and technical standards.mains humInterference on an audio or visual signal related to the power line frequency.marginal stabilitySaid of a system that neither returns to its initial state when disturbed nor diverges to some unstable condition.marine energyAny technique for extracting useful energy from tides, waves, or salinity or temperature gradients of the ocean.Marx generatorA kind of circuit for generating very high DC voltage pulses.MaserA device that produces microwave energy in a similar manner to a LASER.maximum prospective short-circuit currentThe calculated value of current that could flow if a short circuit occurred; a parameter for selection of circuit protection devices.Maxwell's equationsThe fundamental relations between electric and magnetic fields, expressed in concise mathematical form.mechanical rectifierAn electromechanical device for converting alternating current to direct current, using sets of contacts which operate in synchronism with the AC.mechatronicsCombinations of mechanical systems with electronics for sensing and control.memristorA hypothetical non-linear passive two-terminal electrical component relating electric charge and magnetic flux linkage.mercury-arc rectifierA mercury-arc valve; a vacuum tube device that converts alternating current to direct current by an arc in mercury vapor; displaced by solid-state devices, but formerly much used especially in high-voltage direct current transmission.mercury vapor lampA lamp that generates light from a discharge struck in mercury vapor; formerly widely used in outdoor lighting, now replaced by lamps with better efficacy.mesh analysisA strategy for solution of the voltage distribution in some types of electrical networks. mesh networkingA topology where infrastructure nodes connect to other nodes such as to convey information.MetadyneA DC electric machine with crossed fields and two sets of brushes, used as an amplifier or rotary DC transformer. metal rectifierA rectifier made from copper oxide or selenium; formerly widely used before development of silicon rectifiers.micro combined heat and powerEquipment that generates process or space heat and electric power, of a size useful for a single building.microcontrollerA microprocessor integrated with memory and input/output circuits, useful for embedded control.microelectromechanical systemsAn electromechanical system of microscopic size; they may be sensors or actuators.microelectronicsThat part of the field of electronics dealing with integrated circuits.microgenerationSmall-scale electric power production, to provide the needs of a small building or individual consumer.microphoneA transducer that changes sound into electrical signals.microprocessorA computer with its logical, arithmetic and control functions implemented on one or a few integrated circuits.microstripA planar transmission line that is fabricated by printed circuit board technology and is used for microwave-frequency signalsmicrostrip antennaA planar antenna that is fabricated by printed circuit board technologymicrowave ovenA heating appliance that uses microwave energy.microwave radioThe subset of radio technique using wavelengths that are in the range of 3GHz or higher.microwavePart of the radio spectrum with wavelengths shorter than 10centimetres.Millman's theoremA theorem stating the relation between branch currents and voltages for multiple sources in parallel.mineral-insulated copper-clad cableCable with an outer metal cover and insulated by powdered inorganic material, suitable for high temperature; one kind of fire-resistant cable.mobile phoneA handset that connects to the public switched telephone network by radio.ModbusA brand name for a serial protocol for industrial control equipment communication.model predictive controlA control strategy for process systems based on a mathematical model of the process and its disturbances.modemModulator-Demodulator, an interface between a computer system and a telephone network.modulation transformerPart of a radio transmitter used to impress modulation on one amplifying stage.modulationThe impression of information on a carrier wave for transmission.monolithic microwave integrated circuitAn integrated circuit that operates in microwave frequencies and that can be fabricated by printed circuit board technology.monoscopeA raster scan video device that generates a single fixed image for test or identification purposes.Moore's lawThe observation that the number of transistors possible in an integrated circuit doubles approximately every two years.Morse codeA method of transmitting text by long and short impulses and varying delays between them.MOSFETMetal Oxide Semiconductor Field Effect Transistor, a class of transistor using a single type of charge carrier and with a very thin insulating layer between current channel and control gate. If you count those built into integrated circuits, nearly all transistors are MOSFETs.motion controlThat part

circuits.return lossA measure of the power loss due to a signal reflection by a discontinuity in a transmission line or an optical fiber.RF connectorAn electrical fitting used to connect cables carrying radio frequency currents.RF engineeringThe profession that deals with application of radio frequency energy to useful ends.rheoscopeObsolete name for an ammeter; now an instrument for measuring fluid viscosity.rheostatObsolete name for a two terminal variable resistor, usually with a rotating shaft to allow manual or motor driven adjustment.right-hand ruleA mnemonic device for remembering the definitions of the directions of current and magnetic field in generators.rippleA periodic variation in the amplitude of a DC signal, such as found in a power supply with partly effective filtering.RLC circuitA circuit that has only resistors, inductors, and capacitors in it.roboticsThe field of automation that deals with manipulators, especially those that mimic human appendages.robust controlA static control algorithm that can produce acceptable performance over an anticipated useful range of process disturbances.Rogowski coilA current sensing coil that produces a voltage proportional to the rate of change of current; by integration, this can be turned into a measure of current.root locusA graphical method for analyzing the properties of a transfer function as some parameter is varied.root mean squareThe root mean square value of a waveform is the DC value that corresponds to equivalent heating value.rotary converterAn electric machine that converts electric power between two forms, say, AC and DC or single-phase and three phase, or between two different frequencies of AC (the latter two can be performed by the same machine).rotary encoderA transducer that converts rotation of a shaft to a measurement.rotary switchA switch operated manually or electrically with a rotary motion of the contacts.rotary transformerA transformer used to couple electric signals or power between rotating parts. rotary variable differential transformerA transformer-like transducer that measures rotation as an analog value.rotorThat part of an electrical machine that rotates. Not necessarily the armature.RouthHurwitz stability criterionA criterion for predicting the stability of a system with a given transfer function.SallenKey filterA family of active filters with a second-order characteristic, first described in 1955.sample and holdA circuit that takes a sample of a changing analog value and holds onto it until the value can be processed by some other stage.samplingThe process of taking a continually varying signal and turning it into a stream of numbers taken at regular intervals.sampling frequencyThe rate at which an analog value is sampled.satelliteA natural or artificial object that circles another, bound only by gravity.satellite radioA radio broadcasting service using signals from an Earth satellite to customer receivers.saturationThat point in the magnetization of a substance where most magnetic domains are aligned with the external field; further increase of the magnetizing force (H) gives only small increase in the magnetization (B).SCADASupervisory Control and Data Acquisition, management of geographically distributed automation systems such as for an electrical grid.scattering parametersA matrix that describes the electrical behavior of linear electrical networks, most prominently the distributed microwave systems.Schmitt triggerA circuit that behaves like a snap-action switch, suddenly changing state as an analog signal increases; displays hysteresis.Schottky diodeA diode that relies on the junction between a semiconductor and a metal.Scott-T transformerA transformer connection for balanced interconnection of a two-phase system and a three-phase system.s-domainA Laplace transform converts a function from the time domain to the "complex frequency" s-domain; making certain mathematical operations much simpler to evaluate.SDTV"Standard definition television" what descriptions of HDTV call any system with 625 scan lines or less.segmentationA step in digital image processing that groups picture elements of an image that notionally represent some physically significant property of the imaged objects.selenium rectifiersOne type of metal rectifier, though selenium is considered a "metalloid" formerly much used but now replaced by silicon semiconductors.semiconductorA substance with electrical conductivity between that of insulators and conductors; displays a negative temperature coefficient of resistance, and is also sensitive to light. The conductivity of semiconductors can readily be altered by trace amounts of other substances, leading to devices that are the foundation of nearly all modern electronics.semiconductor deviceA device that relies on substances with electrical conductivity between that of insulators and conductors; the controllable conductivity of these materials makes most of modern electronics possible.semiconductor fabricationThe process of turning the raw source of silicon into transistors and integrated circuits.sensorA device or system that converts some physical event into an electronic signal, for further use in measurement or control.serial communicationTransmission of data as a single series of bits over a communication path.series and parallel circuitsElectrical circuits where current passes through multiple elements either one after the other, or side by side, like the rungs of a ladder, or both.shaded-pole motorAn alternating current single-phase motor that produces a rotating magnetic field by a turn of wire around part of a field pole.shaft voltageAn objectionable stray voltage that appears on the rotating part of an electrical machine; very deleterious to supporting bearings.shielded twisted pairTwo wires, wrapped around each other and covered with a flexible shield conductor; intended to reject external interference.short-circuit testA test of machines or apparatus where the load terminals are directly connected; usually done at reduced power to prevent damage, but destructive short circuit testing may be carried out on circuit protective devices. short circuitA path in a circuit that has negligible resistance; often un-intended, a fault.shuntA small value resistor connected around a metering element to carry most of the current; only a small part passes through the meter.siemensA reciprocal ohm, the SI unit of conductance. The former Siemens mercury unit was a unit of resistance.signalSome intentional modification of a physical communication path that is intended to convey information from one place to another.signal processingThe technology to extract information from signals.signal strengthA measure of the usable power of a physical signal.signal-flow graphA formal mathematical treatment of the representation of signal flow through a system, such as an analog computer or a radio receiver.signal-to-noise ratioA measure of the power contained in the useful part of the signal, to the power contained in noise. Often measured in decibels; for example, in sound reproduction a 40 or 50 decibel signal to noise ratio would be broadcast quality, whereas a 10 decibel ratio would represent very difficult operating conditions for a voice radio system.silicon controlled rectifierA four layer semiconductor switching device that can stand off an applied voltage until triggered by an electrical pulse on a control lead.Silicon ValleyInitially, a region of California known for a large number of electronics technology firms.sine waveThe waveform of the mathematical sine function; a fundamental wave shape, free of harmonics.single-phase electric powerAn alternating current power system using only two wires, where peak voltages in each wire occur at the same time.single-sideband modulationA radio carrier modulation system where redundant frequencies of one duplicate side band are filtered out along with the carrier, to save transmitter power.skin effectThe tendency of alternating current to flow at the periphery of a conductor; significant for large conductors at power frequencies, and increasingly significant as the frequency increases.sliding mode controlA control strategy for a nonlinear system that uses discontinuous control signals.slip ringA sliding continuous electrical contact between a machine's rotating parts and the fixed external circuit.small-signal modelAn analytical tool for systems that show significant non-linearity for large signal excursions.smart gridThe application of information technology to improve performance of the electrical grid.Smith chartA graphical tool for display of the impedance of devices at varying frequencies, and for solution of problems of impedance matching in radio frequency design.software engineeringThe profession of designing software systems to meet specified performance requirements.softwareThe set of instructions and data that direct a computer system.solar cellA photovoltaic cell, used to produce power from sunlight.solar energyUseful energy extracted by some means from sunlight.solar micro-inverterAn inverter suitable for use with a single solar panel.solderingThe process of joining metals using a low melting point filler metal; a critical process in the assembly of most electronic devices.solenoidA coil of wire used to create a magnetic field; often a device with a ferromagnetic plunger that moves when the coil is energized.solid stateElectronics that relies on current flow through crystalline lattices.solid state physicsThat branch of physics that studies arrangements of atoms in fixed arrays.sound recordingThe technology of recording sound for later reproduction.space vector modulationA control strategy for variable frequency motor drives.spark spreadThe difference between the revenue from selling a unit of electricity and the cost of the fuel used to make it.spark-gap transmitterA former type of radio transmitter that generated radio frequency current by exciting resonance of a tuned system with an electric spark, used almost entirely for transmission of Morse code.spectrum analyzerAn instrument that graphically displays the amplitude of signals in a narrow bandwidth across a frequency band.speech processingThe techniques for improving the intelligibility of human speech in a communications system.SPICEA set of computer programs for modelling the behavior of electronic circuits.split phase distributionA type of distribution system that uses a center tapped transformer to provide two voltages to a building wiring system.split phase motorA type of single phase motor that uses a resistor, inductor, or capacitor and two windings to obtain a rotating magnetic field.square waveA waveform that spends equal times at the positive and negative peak values with rapid transitions between them.stability theoryThe systematic study of control systems that deals with their response to disturbances.stable polynomialThat class of polynomials representing the transfer functions of stable control systems.stacking factorA measure of the efficiency of filling the space of a machine core or winding; the proportion of active material in any given unit cross section. standing wave ratioA measure of impedance mismatch for transmission lines in microwave engineering; the ratio of peak amplitude of a standing wave to its minimum.star-mesh transformA mathematical technique used in circuit analysis.state observerIn control theory, that which discovers and reports the internal state of a controlled system.state space representationA mathematical technique to represent the internal state of a controlled system as a vector in a Euclidean space.static VAR compensatorA system that adjusts reactive power flow without moving parts, such as an electronically controlled capacitor bank.statorThat part of a rotating electrical machine that remains stationary.steady-stateThe condition of a control system where changes due to some disturbance are no longer occurring at a significant rate.steam turbineA rotating machine that converts the energy of expanding steam to mechanical power through its interactions with sets of moving and stationary blades.step responseThe behavior of a control system in response to an abrupt change of input.stepper motorAn electric motor that moves its shafts in discrete steps as different poles are energized.stereophonic soundSound reproduction systems intended to reproduce sound emanating from more than one direction.Stokes' theoremA theorem about integration of three-dimensional functions, much used in analysis of electric fields.storage tubeA type of cathode ray tube, used for storing images or data.stray capacitanceA property of every conductor, when considered as a non-ideality. structured cablingA system for design of the telephone and data communications cable systems of a building.submarine communications cableA telephone or telegraph cable that is substantially under water.sulfur hexafluoride circuit breakerA kind of automatic circuit protection switch that breaks current in an atmosphere of pressurized sulfur hexafluoride gas to extinguish the arc.super gridA wide area power transmission network that allows interchange over continental distances.supercomputerA computer with a substantially higher level of performance than a general-purpose machine; especially adapted for high intensity calculation on large data sets.superconducting electric machineAn experimental type of generator or motor that has part of its electric circuits in the superconducting state.superconductivityThe loss of all electrical resistance at inconveniently low temperatures.superheterodyne receiverA radio receiver that changes incoming frequencies to a fixed intermediate frequency for processing.superposition theoremThe useful property of a system where the response to the sum is the sum of the responses.surge arresterA device intended to absorb brief transient overvoltages to protect machines or apparatus.surge protectionThe measures taken to protect machines and apparatus from transient overvoltages.switchAn electrical device that opens and closes a circuit; it may be manually operated, automatically operated by some other electrical circuit, or operated by the change in some physical condition such as flow, level, or temperature.switched reluctance motorA motor that relies on induced magnetism in salient poles, instead of a rotor winding. switched-mode power supplyA power converter that regulates voltage by adjusting the time duration of a switching device; this gives reduced heat dissipation compared to an equivalent linear regulator device.switchgearAn array of switches, circuit breakers and related apparatus for power distribution.symbolic circuit analysisAnalytical circuit analysis in terms of expressions with variables, instead of numerical solutions for a particular case of values.symmetrical componentsA technique to simplify analysis of unbalanced polyphase systems.synchroA synchromotor, a class of electrical motors that follows the rotation of a source.synchronizationAligning the timing of two or more sources, such as synchronizing a generator before connecting it to a grid.synchronous circuitA logic circuit where internal state changes only propagate in step with a master clock signal.synchronous motorA motor that rotates at a speed exactly related to the supply frequency.synchronous rectificationA converter from alternating to direct current, where switching devices actively are operated in step with the positive and negative excursions of the supply. synchroscopeAn instrument used to bring an alternating current generator into synchronization with a grid, that uses a moving pointer or set of lamps.system identificationThe technique of development of a mathematical model of a controlled system; model identification.system on a chipAn integrated circuit that combines multiple significant subsystems of a product on one die, for example, analog signal processing and digital controls.system on moduleA packaging of significant functions of a complete product in a form that can be used in more than one product.tachometerAn instrument that measures rotational speed (or angular velocity).tapA connection to a winding at some point between the ends, used to adjust voltage. tap changerA switch that selects which transformer tap is connected to an external circuit; may be manually operated, or power operated; some types can be operated under load for voltage regulation purposes. technical drawingDrawings intended to convey information for construction, operation or maintenance of a system or equipment.telecommunicationThe field that deals with transmission of information over distances longer than can be covered by an unaided human.Telecommunications Industry AssociationA US based trade association that develops technical standards.telegraphA system for transmitting text messages, by wire or other means.telegrapher's equationsCoupled linear partial differential equations that relate the voltage and current on a transmission line.telephone balance unitA balun, a transformer used to convert between balanced and unbalanced lines, as used in telephone circuits.telephone lineOutside plant that connects a central office to subscriber equipment.telephoneTransmission of voice by electrical means.televisionTransmission of moving images by electrical means.Tellegen's theoremA theorem relating to branch currents in an electrical network.teslaThe SI unit of magnetic flux density.Tesla coilA kind of resonant transformer capable of very high voltages; almost identical to an Oudin coil except that it has separately wound primary and secondary.tetrodeAn electron device, nearly always a vacuum tube, with four internal active electrodes.thermionic emissionEmission of electrons from a hot surface; the Edison Effect was an early instance of description of this phenomenon.thermistorA temperature sensitive resistor with a large, somewhat variable, temperature coefficient of resistance.thermocoupleA junction of two dissimilar metals that generates voltage when at a temperature above absolute zero.thermoelectric effectThe conversion between heat flow and current flow, and the reverse.thermostatA temperature sensing switch.Thvenin theoremA theorem which states that any network of current sources, voltage sources and resistors can be simplified to an equivalent network with only a voltage source and series impedance; the dual of Norton's Theorem.third railAn energized conductor in the track bed, using a sliding contact to transfer power to an electric train.three-phase AC railway electrificationApplication of three-phase power to railways.three-phase electric powerElectric power transmission using three conductors carrying currents which peak at separate evenly spaced times in each cycle; widely used for motors.thyristorA four layer semiconductor device that stands off applied voltage until triggered.thyristor driveA variable speed drive, usually with direct current motors, using thyristors as the switching elements.tidal powerExtraction of useful energy, usually as electric power, from the tidal rise and fall of water.time sharingA system whereby multiple human users of a computer can proceed as if they had sole use, while the computer processes each user's software in round-robin fashion.time-invariant systemA systems whose characteristics don't vary significantly with time.topologyThe shape of an electrical network, independent of its size or values.toroidal inductors and transformersMagnetic coils wound around a ring of ferromagnetic material. total harmonic distortion (THD)A measure of the magnitude of harmonically-related frequency components a signal processing stage adds. traction batteryA battery used to store energy for propelling a wheeled electric vehicle.traction currentPower supply for wheeled electric vehicles.traction motorAn electric motor for a wheeled vehicle.traction substationA substation that supplies current to a railway, subway or similar electric wheeled transit.transatlantic communications cableA cable for voice or data running under the Atlantic Ocean.transceiverApparatus that combines a receiver and transmitter.transconductancetransducerAn instrument that converts a physical quantity into another electrical or physical quantity.transfer functionThe mathematical relation between input and output, usually expressed in terms of frequency or complex frequency (s-domain).transformer oil testingExamination of transformer oil for its insulating strength, dissolved moisture and other properties, to ensure it is still suitable for use. transformer oilA hydrocarbon liquid that cools and insulates transformers and other types of electrical apparatus.transformerA static arrangement of conductors and possibly magnetic materials, that transfers energy by electromagnetic induction. transformerboardA kind of insulating paperboard used for internal structures of large oil filled power transformers.transient responseThe short-time response of a system to a disturbance.TransilA brand of transient voltage suppression diode.transistorA three terminal solid state device used as an amplifier or switch.transmissionThe process of getting a signal from one point to another.transmission lineAn arrangement of conductors for movement of electric power; used from DC to upper radio frequencies.transmission system operatorA corporation that runs the transmission system between sources of power and distribution substations.transmission towerA structure for support of overhead transmission wires.transmitterApparatus that prepares a signal for emission into some medium, such as a radio transmitter or a sonar transmitter.traveling-wave tubeA type of microwave amplifier vacuum tube.trembler coilA kind of high-voltage coil that includes an interrupting mechanism, formerly used in automobile ignition systems. TRIACA variation of the thyristor that can pass bidirectional (ac) current.triangle waveA waveform composed of straight-line segments that extend from minus peak to plus peak.trigger transformerA transformer that generates a pulse to initiate some other device, such as a thyristor or a flash tube.triodeAn electron device, nearly always a vacuum tube, that has three active electrodes.trolley poleA support for a current collector on a vehicle.trolleybusStrictly, a passenger vehicle that collects motive electric power from a pair of overhead conductors.tuned circuitA circuit that displays a peak response at some frequency.twisted pairTwo wires twisted around each other, possibly covered with an overall sheath; this configuration rejects some kinds of interference.two-phase electric powerAn electric power system using two sets of alternating currents, displaced in time by a quarter period.two-port networkA network that has two places to exchange energy with its surroundings.two-sided Laplace transformA variant of the Laplace transform that simplifies certain operations.ubiquitous computingA scenario where computer science is made to appear everywhere.ultrasonic motorA motor that relies on a component oscillating at an ultrasonic frequency.ultrasonicsTerm for the field of study pertaining to pressure oscillations in air or other media that are above the range of human hearing.ultrasoundSound having a frequency above the range of normal human hearing. A portmanteau of the former description of 'ultrasonic sound'undersamplingSampling a signal at less than the Nyquist rate; can produce alias frequencies or other artifacts.unijunction transistorA three terminal semiconductor device with a definite switching characteristic and only one PN junction.unipolar motorA heteropolar motor; all currents in this design flow in only one direction.unshielded twisted pairTwo wires wrapped around each other, but without a conductive cover.upsamplingSampling at greater than the Nyquist rate, which makes filter design easier.utility frequency60 or 50 cycles per second, used for electric power.utility poleA columnar structure that carries wires for electrical power distribution, cable television, telephone or similar services.vacuum capacitorA capacitor using vacuum as its dielectric; useful at high voltages or radio frequency.vacuum tubeAn electron device that relies on flow of electrons through a vacuum or low-pressure gas; a valve. The first electronic devices that could amplify.valveA switching element (mercury arc, thyristor, or other device) in a high-voltage direct current converter; each phase contains two or more valves, which may be series-connected for higher voltages. Or, a vacuum tube.variable capacitorA capacitor whose value can be changed, by rotating a shaft, squeezing a plate or by an electrical signal; for example, as used to tune a radio.variable-frequency driveA power converter that varies the speed of an AC motor by changing its frequency; usually, today, a solid-state device.VariacOne brand of adjustable transformer, that can essentially continuously vary the ratio between primary and secondary.varicapVariable capacitor usually a diode whose reverse-biased junction capacitance can be varied by applied voltage.varistorVariable resistor a protective device that has a high resistance at low voltage but momentarily switches to lower resistance on exposure to a high voltage.vector controlA strategy for control of variable-speed motor drives.vector groupThe classification of the connections of a polyphase transformer.vehicle-to-gridA concept to use electric vehicle batteries as a form of grid energy storage.vehicular automationAutomatic systems to assist, or replace, the driver of a vehicle.VersoriumAn antique version of an electroscope.vibratorAn electromechanical interrupter, part of a DC-to-AC converter in a battery-operated vacuum tube radio, or similar application. Some had additional contacts to act as a synchronous rectifier.video camera tubeA family of vacuum tube devices used to pick up images and transmit them electronically.video processingThe techniques used to enhance video images.virtual instrumentationA software-intensive measuring system that can be programmed to emulate any of a number of conventional measuring instruments, or some combination of measuring functions.virtual power plantA strategy for managing a collection of disparate power sources, interconnected with a communications network, as if they were a single centralized power plant.VLSIVery Large Scale Integration, the ability to put hundreds of thousands of interconnected transistors onto one chip.voltThe SI unit of electrical potential difference; moving a charge of one coulomb through a potential of one volt transfers one joule of energy.voltageThe electric potential difference between two points.voltage compensationGenerally, adjustment of a voltage source to compensate for voltage drop; techniques differ widely between a computer power supply and a long-distance power line.voltage-controlled amplifierAn amplifier that has its gain controlled by a voltage signal.voltage controllerA device that adjusts the (effective) voltage to a load.voltage converterAny device that changes electric power at one voltage to power at a second; a transformer is a common example of an AC voltage converter.voltage divisionA circuit that produces an output voltage that is some, perhaps adjustable, fraction of the input voltage.voltage doublerA rectifier circuit that can product an output DC voltage of nearly twice the input AC voltage.voltage regulationA measure of how a source maintains its output voltage for varying load.voltage regulatorA system that automatically stabilizes the voltage at which power is supplied to a downstream system.voltage sourceIn circuit theory, a hypothetical element that maintains a specified voltage between its terminals independent of the current through it.voltage spikeA transient electrical voltage higher than normal appearing on an electrical supply.voltage-to-current converterA circuit that produces an output current proportional to an input voltage.volt-ampereThe unit of apparent power in an AC circuit.voltmeterAn instrument for measuring potential difference.war of the currentsThe late 19th century commercial dispute on whether AC or DC was the best system for power distribution.Ward Leonard controlA speed control system for DC machines using an interconnected generator and motor.wattThe SI unit of power, work done per unit time.wattmeterAn instrument that measures electrical power.waveguideA tubular structure that guides electromagnetic waves, much used at microwave frequencies; an optical fiber is a kind of optical waveguide.weberThe SI unit of magnetic flux.wet transformerIn telephone systems, a matching transformer that can operate while carrying a substantial DC "wetting" current.Wien bridge oscillatorA type of electronic oscillator that generates sine waves and is based on a bridge circuit.Wiener filterA class of filters used in signal processing, used to fit an estimate to noisy signal data.Williams tubeA cathode ray vacuum tube used as an early form of computer memory.wind farmAn array of two or more wind turbines, usually sharing a substation.wind powerGeneration of electricity (sometimes mechanical power) from wind.wind turbineA rotating machine that extracts energy from wind.wireA strand of metal much, much, longer than it is wide; a conductor, often coated with insulation.wireless networkData network relying on radio for the connection to end device; may span a building or a larger area.wireless telegraphyTransmission of text by radio; usually implies Morse or radio-teletype.X-rayElectromagnetic radiation with wavelengths shorter than ten nanometres. Strictly: radiation that is produced in the electron shell of atoms.X-ray lithographyA developing technique for production of very high density structures in integrated circuits.Yagi antennaA type of radio antenna using a feeder element, one or more parasitic reflector elements, and one or more director parasitic elements to provide a directional characteristic; the classic home TV rooftop antenna was usually a Yagi antenna.Y-delta transformA mathematical technique in circuit analysis to simplify a circuit.Zener diodeNickname for "voltage regulator diodes" which may rely either on the Zener effect or avalanche breakdown to maintain a roughly constant voltage; the two effects have opposite temperature coefficients of voltage.Ziegler-Nichols tuning methodIt is a heuristic method of tuning a PID controller.zigzag transformerA multiwinding three phase transformer, sometimes used for grounding.Z-transformA mathematical operation that converts a set of evenly spaced measurements of an analog signal into a series of frequency components.Glossary of engineeringGlossary of civil engineeringGlossary of mechanical engineeringGlossary of structural engineering^ International Bureau of Weights and Measures (2006), The International System of Units (SI) (PDF) (8thed.), p.120, ISBN92-822-2213-6, archived (PDF) from the original on 2021-06-04, retrieved 2021-12-16^ American Heritage Dictionary of the English Language, Online Edition (2009). Houghton Mifflin Co., hosted by Yahoo! Education.^ The American Heritage Dictionary, Second College Edition (1985). Boston: Houghton Mifflin Co., p. 691.^ McGraw-Hill Dictionary of Physics, Fifth Edition (1997). McGraw-Hill, Inc., p. 224.Retrieved from " 2 Page notice You are not logged in. Your IP address will be publicly visible if you make any edits. If you log in or create an account, your edits will be attributed to a username, among other benefits. Content that violates any copyrights will be deleted. Encyclopedic content must be verifiable through citations to reliable sources.Retrieved from " Take a step toward your new career Find out how you can gain the experience necessary to break into your desired career. Whether you have a dream job in mind, you want to be your own boss, or you're looking for stability and good pay, take your first step here. Do you need to tailor your resume for a job application? Are you worried about your upcoming interview? Learn how to nail each step of the hiring process with our Toolkit. Learn How to Become's 15 Best Job Search Sites Seeking a job? These career sites are a great way to search through positions that can help with everything from entry-level work to career advancement. Check out our listing of... Become Team May 1, 2023 Grad's Guide to Getting Hired The right tools can make all the difference to a recent grad beginning their job search. Learn tips and find resources to maximize your search efforts. Become Team July 17, 2023 How to Nail Your Next Interview Dont let your nerves get the best of you on interview day. Learn tips, do's and donts to nail your next job interview. Become Team October 5, 2021 Resume Guide The resume has joined the digital revolution. Find out how to revamp yours with the best and most marketable resume trends. Become Team March 10, 2023 Professional Skills Training Skills and trades are the future of work. Explore paths that align with your long-term career goals. The Baby Boomer generation is living much longer than their predecessors, fueling massive growth in health care jobs, including medical coders. The demand for medical coders is expected to grow... Accredited vocational schools and career colleges are financial aid eligible. Get your vocational and trade school financial aid questions answered and find scholarships. Vocational training programs offer students the opportunity to pursue a career in the skilled trades. Learn how to pursue vocational training. If you're not sure what you want to do yet, explore some tips and career ideas based on your circumstances and needs. 100%(8)100% found this document useful (8 votes)39K views14 pagesThis document contains 45 multiple choice questions about basic electrical engineering concepts. The questions cover topics such as AC vs DC power, circuit elements like resistors, capacitorAI-enhanced title and descriptionSaveSave BASIC-ELECTRICAL-ENGINEERING-MCQs-PDF.pdf For Later100%100% found this document useful, undefined100%(8)100% found this document useful (8 votes)39K views14 pagesThis document contains 45 multiple choice questions about basic electrical engineering concepts. The questions cover topics such as AC vs DC power, circuit elements like resistors, capacitors, and inductors, electrical units and formulas, power factors, transformers, and electrical power generation and transmission systems. Sample questions ask about the properties of AC waves, circuit analysis theorems, component color coding, and the advantages of AC power distribution.100%(8)100% found this document useful (8 votes)39K views14 pagesThis document contains 45 multiple choice questions about basic electrical engineering concepts. The questions cover topics such as AC vs DC power, circuit elements like resistors, capacitorAI-enhanced title and description757 Words |2 PagesElectrical Engineering is probably expanding more than any other field of engineering. This field deals with the study and application of electricity, electromagnetism, and electronics. Electrical engineers study and apply the physics and mathematics of electricity, electronics, and electromagnetism to both large and small scale systems to process information and transmit energy. (Cal Poly State University)Since the early ages at around 500 B.C. are recorded documents that bring up questions of853 Words |2 PagesElectrical engineering arose in the late 1800s and was heavily influenced by the work of many pioneers such as Nikola Tesla, Thomas Edison, and George Westinghouse. These inventors contributed greatly to the work in which electricity could be efficiently produced, distributed and used to improve society in a big way. Electrical engineering is a form of science that specializes in the study of electricity, electromagnetism, and electromechanical devices. Mathematics is the common language that is1054 Words |3 Pagespractical concepts. A good engineer should be strong both in theory and practical. Engineers are the main key in an Engineering company. It is according to their suggestions and proposals, changes takes place in a company.I had the fantastic opportunity to visit various substations and switching stations in Darwin with my supervisor Shaun De Zylva, and he explained me all the electrical and circuit components inside the substation. It was quite intriguing to know how electricity is distributed to various608 Words |2 PagesPurpose Statement:Electrical engineering has always fascinated me. I was always keen to sort out the complexities of different system. My decision to choose field of electrical engineering was based on my passion and parents will. In early stages of my education, I started working hard to achieve my goal. My vision was to be a successful engineer to serve my community. When I used to study computer science, my interest developed in inventions and transformations. Technological innovations have1365 Words |3 Pages2.1 Electrical Engineering Industry in General Electrical engineering industry is primarily concerned with the technology of electricity, specifically in the design and application of devices and circuitry for generation of electricity. The other major activities of electrical engineering industry comprises of controlling power generated equipments and communication devices of telephone, radio and satellite systemsIt generally deals with the study and application of electricity, electronics682 Words |2 PagesSTATEMENT OF PURPOSEAfter one year's work experience as an electrical engineer at _____, a private LPG filling company with various filling plants located in Pakistan. After the completion of my undergraduate degree in 2012, I have been making constant efforts to develop better understanding in the field of Electrical Engineering. So, I joined_____ and worked there as a Trainee Electrical Engineer for over 1 year. My training responsibilities areas were circuit breakers supervision, switch809 Words |2 Pagesand coursework in Electrical Engineering to enhance my competencies in this field. I intend to complete my master's degree in order to pursue my doctorate. The research that I am most interested in pursuing at Northeastern University surrounds the optical properties of MEMS devices, and the development of substrate-based fast electro-optical interfaces. My interest in this area stems from my undergraduate study in MEMs development for tri-axial accelerometers. Engineering has been a key interest1912 Words |4 PagesElectrical Engineering Work PerformedElectrical Engineers research, develop, design, and test electronic components, products, and systems for commercial, industrial, medical, military, and scientific applications (Cosgrove 749). They are concerned with devices that use small amounts of electricity that make up electronic components such as integrated circuits and microprocessors. By applying principles and techniques of electronic engineering they design, develop, and manufacture products such1910 Words |4 PagesStatistics defines an electrical engineer as someone that designs, develops, tests, and supervises the manufacturing of electrical equipment such as electric motors, radar and navigation systems, communications systems, or power generation equipment. Electrical engineers work with but are not limited to electricity, electronics and electromagnetism (What Do Electrical Engineers Do?). These engineers can work in labs, offices or on the floor of some major industries. Electrical engineers may solve1117 Words |3 Pagescome. Hence my desire to do masters in electrical engineering with communications as my major. My interest in Electrical dates back the early days of my high school. My career objective is to pursue research in the field of Electrical Engineering. I am of firm conviction that suitable opportunity to pursue graduate studies will help in my endeavor towards realizing my goal, paving the path for self-actualization. The field of electrical & electronics engineering has always fascinated me. I picked up1295 Words |3 Pagespredictable pattern when subjected to given conditions (Naiah & Kamakshaiah, 1995). What Electrical engineering? Electrical engineering is a field that deals with the applications the technology of electricity, such as generating, distributing electrical energy, and programing electrical systems. In this field, there are many famous scientists. For example, Alexander Graham Bell, who1269 Words |3 Pagesgradually peaked after I read the about the work done by eminent scientists in these fields. It was then I decided to pursue Electrical engineering since it comprised of subjects that catered to my interests like power and electromagnetism. My undergraduate studies got me interested in the application of mathematics in engineering and I topped the subject in my second year of engineering and was also a University Rank Holder (9th). Mathematics simplifies concepts into numbers, constants, variables and equations745 Words |2 PagesWriting in Electrical Engineering Have you recently found yourself lost after high school, knowing that you want to go to college, but having no idea what to major in? I sure did! So after reading through the NMSU undergraduate catalogue and asking peoples advice, I found out that our university has one of the top 5 engineering colleges in the entire country and problems were solved! With a fascination of electronics and a steady hold on math, I decided that Electrical Engineering was the choice1012 Words |3 PagesRobotics9-11-17Electrical engineering An electrical engineer is someone who designs and develops new electrical equipment, solves problems and tests equipment. They work with all kinds of electronic devices, from the smallest pocket devices to large supercomputers. Electrical engineering deals with electricity, electro-magnetism and electronics. It also covers power, control systems, telecommunications and signal processing. These engineers are usually concerned with large-scale electrical systems such1035 Words |3 Pagespursuing, I am particularly interested in a career as either an electrical engineer or a software developer. Electrical engineers fall within the Career Cluster of architecture and engineering. From 2012 to 2022, employment in the field of electrical engineering is projected to grow 4 percent, which is less than the average projected growth rate for all careers. There are no major geographic restrictions to becoming an electrical engineer, however most move to where the companies are located. Travel721 Words |2 Pagesthe unemployment. This has motivated me to pursue higher studies in MS (Electrical Engineering) and that to in communication and signal processing which is my forte, but I would be glad if at all i get a chance of doing a PHD in "Arizona State University" INSPIRATIONAL FACTORS :- My Brother Who is a graduate from RIT(Rochester institute of technology) has been my motivational drive to take electrical engineering as my profession, not only that, in my view:plenty of online courses which are806 Words |2 PagesElectrical engineering is a field that majorly involves the use of technology in the designing, developing, and testing electrical devices. Majors in electrical engineering focuses on the physics of electricity and magnetism, analysis and design tools of engineering, and circuits and system mathematics. If one takes a course in engineering, they are trained on how to design and make products, which are safe and can enhance human life. This course is not popular to many for it is very demanding and1040 Words |3 Pagesworld of Engineering. The world functions effectively because of engineering. The beautiful aspect being the ability to create, utilize resources, and bring something into existence that will change or construct something beneficial to humanity. There is not a more exciting field to be involved in, especially now, as the on demand world continues to thrive and advance into new levels. Electrical Engineering (EE) is the field that interests me most though I am open to other fields of Engineering if I630 Words |2 Pagesand a strong predilection towards research have made the choice of further study an obvious one for me. My ultimate objective is to pursue a career in research, either in industry or in academia. I strongly believe that a Masters Degree in Electrical Engineering from your esteemed University will act as a crucial first step in the process of realizing my career objectives.I have always cherished a dream to become an Engineer, a dream that was innate and developed slowly over the years. Right from2458 Words |5 PagesA Career in Electrical Engineering Choosing the right career can mean the difference between being satisfied and being disappointed with my life. Many factors can influence the career that I may have for the rest of my life. A decision that I am going to make at the young age of nineteen will have a major impact on the next ten years if not the rest of my life. In order to make the best decision possible for my future I have decided, if not forced, to research a career of interest to me. The two McqMate McqMate.com is an educational platform, Which is developed BY STUDENTS, FOR STUDENTS, The main objective of our platform is to assist fellow students in preparing for exams and in their Studies throughout their Academic career. MCQMATE IS ALSO AVAILABLE ON Contacts Share copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. The demand for electrical energy is increasing day by day. So a boom in the consumption of electrical energy has been seen in the last few decades. It is the very reason for the growth in the field of electrical engineering. Due to this growth, carriers in this field are increasing day by day.Almost every electrical company conducts computer-based tests to find out the most eligible candidates. In these tests, objective-type questions are asked. So the importance of electrical MCQ questions and answers has been increased very much.To keep this requirement of students, I have made a series of basic electrical questions and answers pdf on my blog. These questions are taken from popular examinations like UPPCL, NHPC, NTPC, State Electricity Boards, ONGC, BEL, BUHL, HAL, CPWD, GATE, Central, and State Services for recruitment or admission to higher courses.I hope readers will appreciate my this effort. If you have any questions or suggestions, you can comment in the comment section. Basic Electrical Questions and Answers Pdf Downloadyourelectricalguide.com/ basic electrical questions and answers pdf download, electrical engineering questions and answers pdf free download. Tags: Dogar Brothers PDF BooksAre you gearing up for your next entry test, or preparing for job interviews like PPSC, CSS, or PMS? Look no further! Were thrilled to share our comprehensive collection of 3700+ Electrical Engineering MCQsElectrical Engineering Solved MCQs PDF Guide in PDF format, complete with solved answers. This resource is designed to support exam preparation, covering the key concepts and frequently asked questions in Electrical Engineering. Many of these questions are derived from past papers, ensuring you focus on topics and formats youre likely to encounter in the actual exams. Why This PDF is Essential for Exam PreparationThis collection is tailored for anyone preparing for competitive exams or interviews in the Electrical Engineering field, including: PPSC, CSS, PMS Exams Aligns with the syllabus and frequently asked questions. Engineering Job Interviews Perfect for technical test preparation. Entry Test Preparation From fundamentals to advanced concepts.Our PDF contains solved answers, giving you a complete understanding of each concept and enhancing your confidence. 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For the academic journal, see Electromagnetics (journal). "Electromagnetic force" redirects here. For the force exerted on particles by electromagnetic fields, see Lorentz force. "Electromagnetic" redirects here. The term may also refer to the use of an electromagnet.Electromagnetic interactions are responsible for the glowing filaments in this plasma globe.ElectromagnetismElectricityMagnetismOpticsHistoryComputationalTextbooksPhenomenaElectrostaticsCharge densityConductorCoulomb lawElectretElectric chargeElectric dipoleElectric fieldElectric fluxElectric potentialElectrostatic dischargeElectrostatic inductionGauss's lawInsulatorPermittivityPolarizationPotential energyStatic electricityTriboelectricityMagnetostaticsAmpre's lawBiotSavart lawGauss's law for magn

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