

Index

- AC Series Motor or Commutator Motor, 885
- accelerate, 355
- Air gap leakage flux, 543
- alternator or synchronous generator, 501
- Applications of DC Motors, 409
- Armature Reaction in alternators, 544
- armature reaction, 349
- armature, 304
- Armature-controlled DC Servomotors, 895
- Asphalt, 315
- asynchronous machines, 722
- Auto-transformer Starter, 834
- auto-transformer, 195
- Auxiliary Motor, 706

- Back emf, 397
- Back pitch, 313
- Back to back test, 167
- Back-end, 312
- Bearings, 307
- berry type transformer, 93
- Blocked Rotor Test, 769
- Boosters, 208
- brake horse power, 399
- Brake Test, 472
- breadth factor, 523
- Breather, 295
- Bright Lamp Method of Synchronising Single-phase Alternators, 631
- brush holder, 306
- Brushless DC Motors, 907
- Brushless Excitation System, 511
- Buchholz Relay, 295
- Bushings, 89

- Capacitor Motors, 875
- Capacitor run motors (fan motors), 876
- Capacitor start and capacitor run motors, 876
- Capacitor start motors, 875
- centre-tap primary, 275
- Characteristics of DC Compound Motors 408
- Characteristics of DC Motors, 405
- Characteristics of DC Series Motors, 407
- Characteristics of DC Shunt Motors, 405
- chorded factor, 522
- Circle Diagram for an Induction Motor 782
- Circle Diagram, 781
- Class A Motors, 811
- Class B Motors, 811
- Class C Motors, 811
- Class D Motors, 812
- Class E Motors, 812
- Class F Motors, 813
- Closed-circuit cooling, 618
- co-efficient of coupling, 35
- coercive force, 23
- Cogging in 3-phase Induction Motors, 795
- coil span factor, 522
- Coil span or coil pitch, 313
- cold rolled grain oriented steel (CRGOS), 83
- commutating emf, 358
- commutation, 355
- Commutator Action, 308
- Commutator pitch, 313
- commutator segments, 309
- Commutator, 306
- compensating winding, 363
- Compound motor, 401
- Compound wound generators, 370
- Concentrated and distributed windings 513
- Condenser bushing, 90
- Condition for Maximum Efficiency, 146, 385
- Condition for Maximum Torque, 753

- Conservator oil tank, 295
- Continuous Disc Winding, 86
- Cooling of Transformers, 291
- Core Material, 83
- Core-type Transformers, 93
- counter balancing current, 115
- Crawling in 3-phase Induction Motors 795
- Critical load resistance, 378
- Critical resistance, 378
- Cross magnetising ampere-turns, 352
- Cruciform core section, 84
- Cumulative compound motors, 402
- cumulatively compound wound generator, 371
- Damper winding, 507, 707
- Dark Lamp Method of Synchronising Single-phase Alternators, 629
- Dark Lamps Method of Synchronising Three-phase Alternators, 632
- DC Exciters, 509
- DC motor, 396
- DC Servomotors, 895
- Dd6 Delta-delta connection, 237
- DdO Delta-delta connection, 237
- dead short circuit, 183
- Deep Bar Cage Rotor Motors, 799
- Degree of Compounding, 380
- Degree of Re-entrant, 314
- Delta-Zigzag Connections, 241
- demagnetising turns ampere-turns, 352
- Determination of Relative Primary and Secondary Windings, 227
- Determination of X_d and X_q , 599,
- developed winding diagram, 320
- Differential compound motors, 402
- differentially compound wound generator, 371
- direct axis or d-axis, 598
- Direct load test, 552
- Direct on Line (D.O.L.) Starter, 829
- Dissimilarities in induction motor and transformer 743
- Dissimilarities of magnetic and electric circuits, 6
- distribution factor, 523
- Distribution Transformers, 181
- Double Cage Induction Motor, 800
- Double or duplex lap winding, 316
- Drum Winding, 314
- dummy coils, 332
- Dy1 Delta-Star Connections, 239
- Dy11 Delta-Star Connections, 239
- dynamically induced emf, 31
- eddy current loss, 44
- eddy currents, 44
- Effect of Armature Reaction on emf of Alternator, 546
- Effect of Change in Excitation, 701
- Effect of Change in Load on a Synchronous Motor, 704
- Effect of Load on Synchronous Motor 667
- Effect of Rotor Resistance, 757
- Electric Braking, 451
- electro-magnetic induction, 28
- electromagnetic torque, 341
- Electro-mechanical energy conversion devices, 1
- End housings, 306
- End-connection leakage flux, 543
- Energy Efficient Motors, 926
- equalisers, 328
- equalising connections, 327
- equivalent reactance in transformers, 120
- Essential Features of Braking, 452
- Excitation Systems, 509
- exciting coil, 304
- exciting current, 104
- Exciting reactance, 104
- Exciting resistance, 104
- Faraday's first law of electro-magnetic induction 29
- Faraday's laws of electro-magnetic induction 29
- Faraday's second law of electro-magnetic
- Faults in DC Machines, 492
- Feedback Control System, 893
- Ferrari's principle, 539
- fibre glass tape, 315
- field test, 487
- Field-controlled DC Servomotors, 895
- flat compounded generator, 380
- Fleming's Left Hand Rule, 56, 396
- Fleming's Right Hand Rule, 30
- four-point starter, 414
- Frequency of Rotor Currents, 728
- friction and windage losses, 399
- Fringing, 8
- Front pitch, 313
- Front-end, 312

- full pitch, 521
 Full pitched and short pitched windings 513
 Generator action, 72
 generator, 48
 Geometrical Neutral Axis (GNA), 349
 Governor's Characteristics, 652
 Gramme-ring winding, 314
 harmonics., 104
 Heat Run Test, 770
 Helical Winding, 86
 Highest transmission voltage in India 750 kV, 224
 Hopkinson's test, 479
 Hunting, 653
 HV windings, 83
 hysteresis loss, 23
 Hysteresis Motors, 884
 ideal transformer, 94
 IEC (International Electro-technical Commission), 228
 Impedance matching transformer, 181
 Indirect Method, 552
 Induction Generator, 920
 Induction Motor on No-Load, 740
 Induction, 30
 Inrush of Magnetising Current, 106
 Instrument Transformers, 181
 Interpoles, 361
 Inverted V-Curves, 704
 iron factor, 84
 iron losses or core losses or magnetic losses., 44
 Isolated Induction Generator, 921
 Isolation transformer, 181
 Kapp Regulation Diagram, 131
 Kramer System of Speed Control, 851
 laminations, 83
 Lap and Wave windings 514
 Lap winding, 305
 Leakage co-efficient or leakage factor 8
 leakage flux, 8
 leakage fluxes in transformers, 117
 Leatheroid, 315
 Lenz's Law., 30
 Linear Induction Motor (LIM), 915
 Load Sharing between Transformers, 184
 Load Sharing between Two Alternators 637
 Load Sharing, 255,
 Locked-rotor torque, 673
 LV windings, 83
 magnetic circuit, 3
 Magnetic field intensity, 4
 magnetic field, 2
 magnetic flux density, 4
 Magnetic flux, 4
 magnetic hysteresis., 22
 Magnetic Neutral Axis (MNA), 349
 magnetic saturation, 105
 magnetising component of current, 103
 magnetisation or B-H Curve, 21
 Magneto motive force (mmf), 4
 magnetostriction effect, 142
 Maintenance Schedule of induction motors 818
 Major insulation, 88
 Methods to make 1-phase induction motor self-starting, 870
 Minor Insulation, 88
 Motor action, 72
 Motor Enclosures, 808
 motor, 48
 mutual-inductance, 34
 Mutually induced emf, 33
 Nature of Field Produced in Single Phase Induction Motors, 859
 Necessity of a Starter, 829
 Necessity of Starter for a DC Motor, 411
 NEMA (National Electrical Manufacturers Association), 808
 No Load Test, 767
 Non-Salient pole type rotor, 505
 No-volt relay, 830
 NVRC.(no volt release coil), 413
 Off Load Tap-changer, 267
 OLRC(over load release coil), 413
 On-load Tap-changer, 267
 Open circuit test, 553
 Open-circuit cooling, 618
 Operating Region, 757
 Oscillating neutral, 235
 overload relay, 830
 parallel magnetic circuit., 7
 Parallel Operation of Alternators, 626

- Parallel operation of two three-phase transformers, 252
- percentage impedance, 183
- Performance Curves of Induction Motors, 796
- Permanent Magnet DC Motors, 917
- Permanent-magnet (pm) Stepper Motor, 909
- Permanent-magnet Armature-controlled DC Servomotor, 896
- Permeability, 4
- Permeance, 4
- Phase spread, 516
- Phase wound rotor, 723
- Phasor Diagrams of Salient-pole Synchronous Motor, 678
- pitch factor, 522
- Plugging, 453
- Polarity Check, 183
- Polarity of 3-phase Transformer Windings, 227
- Polarity Test on transformers, , 158
- Pole pitch, 313
- pole shoe, 304
- Porcelain bushing (oil filled), 90
- Potier Method., 559
- Potier Regulation Diagram, 580
- Power Developed by Cylindrical Synchronous Generators, 592
- Power Developed in a Salient-pole Synchronous Motor, 679
- Power Developed in a Synchronous Motor, 673
- Power Factor Control by Changing the Brush Position, 902
- power flow diagram for a DC generator, 462
- power flow diagram for a DC motor, 462
- Power Flow Diagram of Induction Motor 744
- Power flow in generator action, 70
- Power flow in motor action, 71
- Power Transformers, 181
- primary winding, 82
- principle of a transformer, 82
- Production of Revolving Field, 724
- Production of Sinusoidal Alternating emf 503
- Pull-in torque, 673
- Pull-out torque, 673
- quadrature axis or q-axis, 598
- Rating of Alternators, 542
- Regenerative braking., 455
- Regenerative test, 167
- Reluctance Motors, 882
- Reluctance Start Motor, 880
- Reluctance, 4
- Reluctivity, 5
- residual magnetism, 23
- Resultant pitch, 313
- retarded, 355
- retentivity, 23
- Reversal of Direction of Rotation, 726
- revolving field, 535
- ring diagram, 322
- Rotating Magnetic Field from 2-phase Supply, 866
- Rotor efficiency, 745
- Rotor Impedance, 731
- Rotor Power Factor, 731
- Rotor Reactance, 730
- Rotor Resistance Starter for Slip Ring Induction Motors, 836
- Running Torque, 673
- Salient pole type rotor, 505
- sandwiched winding, 88
- Scherbius System of Speed Control, 851
- Schrage motor, 898
- Scott connections, 275
- secondary winding., 82
- Self induced emf, 33
- self inductance or inductance, 34
- self-starting, 666
- Separately excited DC motors., 401
- series magnetic circuit., 6
- series motor starter, 422
- Series motor, 401
- Series Split-field DC Servomotors, 896
- Series wound generators, 370
- Servomechanism, 894
- Servomotors, 894
- Shaded Pole Motor, 879
- Shaded-pole AC Servomotor, 897
- Shell type Transformers, 93
- Shifting of Load, 636
- Short circuit test, 553
- short pitched, 521
- short-circuit ratio (SCR), 556
- Shunt motors, 401
- Shunt wound generators, 369

- Significance of air-gap in synchronous machines, 509
- silicon impregnated insulation, 315
- Similarities in induction motor and transformer 742
- Similarities of magnetic and electric circuits, 5
- Simplex lap winding, 316
- simplex wave winding, 330
- Single layer and double layer windings 513
- Single-phase and poly-phase windings 513
- single-phase induction motors, 857
- Single-phase Synchronous Motors, 881
- slip rings, 307
- Slip speed, 727
- Slip, 727
- Slot leakage flux, 543
- Slot pitch, 515
- Slot pitch, 522
- Space Harmonies in induction motors 795
- special purpose machines, 893
- Special purpose transformer, 181
- Speed Control by Cascade Method, 848
- Speed Control by Changing the Brush Position, 901
- Speed Control by Changing the Poles, 847
- Speed Control by Changing the Slip, 845
- Speed Control by Changing the Supply Frequency, 847
- Speed Control by Injecting an emf in the Rotor Circuit, 850
- Speed Control of Induction Motors, 844
- speed of a DC motor, 428
- speed of DC series motors, 440
- speed regulation of a DC motor, 432
- Spider, 506
- Spiral winding diagram, 321
- Spiral Winding, 85
- Split Phase Motors, 871
- split ring, 308
- Squirrel cage rotor, 723
- Stabilization Provided by Tertiary Winding in Star-star Transformer, 260
- Star-Delta Starter, 832
- Starting Methods of Squirrel Cage Induction Motors, 829
- Starting Torque, 754
- Star-Zigzag Connections, 242
- statically induced emf, 33
- Static-Excitation System, 510
- Stator core:, 722
- Stator Resistance (or Reactance) Starter 831
- Stator Resistance Test, 766
- Stator winding, 722
- step down transformer, 80
- step up transformer, 80
- Stepper Motors, 908
- Stray losses, 384
- Submersible Pumps and Motors, 922
- Subtractive Polarity, 205
- Sub-transient, 613
- Sumpner's test, 167
- Suppression of Harmonics in alternators 526
- Swinburne's test, 474
- Switched Reluctance Motor (SRM), 914
- Synchronising Current, 647
- synchronising of alternators, 627
- Synchronising Power, 647
- Synchronising Torque, 647
- synchronous capacitor, 707
- Synchronous impedance, 548
- synchronous motor, 665
- Synchronous reactance, 548
- Synchroscope, 635
- Tap Changers, 265
- teaser transformer, 275
- Tertiary Winding, 257
- Testing of DC series machines, 487
- Testing transformers, 181
- Tests Performed on an Induction Motor, 766
- third-harmonic, 105
- Three phase induction motors, 722
- Three-phase Rotating Magnetic Field 541
- Three-phase Transformer Connections, 229
- Three-point Shunt Motor Starter, 413
- torque angle, 51
- Torque Produced by 1-phase Induction Motor, 860
- Torque-slip Curve, 756
- Transformation ratio, 82
- transformer core, 83
- Transformer efficiency, 145
- transformer on no-load, 103
- Transformer, 80
- Transients in Alternators, 611
- Triple or triplex lap winding, 317
- T-T connections, 275

Two Bright and One Dark Lamp Method of Synchronising Three-phase Alternators	633
Two-phase AC Servomotors,	897
Two-phase to Three-phase conversion,	277
Two-Reactance Concept for Salient Pole Synchronous Machines,	597
Two-Reaction Concept,	600
Universal Motor,	886
useful flux,	8
Variable-reluctance (vr) Stepper Motor,	912
V-Curves,	703
Vee-Vee or open delta connections,	270
voltage regulation,	551
Voltage-ratio Test,	766
Ward-Leonard system,	431
Wave winding,	305
winding factor.,	524
working component of current,	103
Yd1 Star-Delta Connections,	238
Yd11 Star-Delta Connections,	238
Yoke,	303
Yy0 Star-star connection,	234
Yy6 Star-star connection,	234
Zero Power Factor Method,	559