TIT P.G. ENTRANCE EXAMINATION (TITPGEE) 2026

INFORMATION BROCHURE

TRIPURA INSTITUTE OF TECHNOLOGY
DEPARTMENT OF HIGHER EDUCATION
GOVERNMENT OF TRIPURA
NARSINGARH
P.O. NARAYANPUR BAZAR
TRIPURA (WEST) PIN: 799015

15/06/2026

1. About the Institute:

The Institute (erstwhile Polytechnic Institute Narsingarh) bred from its embryo in the year 1958 with three conventional branches of Civil, Electrical Engineering and Mechanical Engineering affiliated to the West Bengal State Council of Technical Education. Later, one more branch namely Electronics & Tele-Communication Engineering paved its way into the system in the year 1997.

The institute through its excellence and glorified journey over a period of more than 45 years could attract name, fame and reputation countrywide and as a result the Ministry of Human Resource was kind enough to extend its assistance through World Bank under Tech. Ed.-III Project for the growth of this institute in terms of capacity expansion and quality improvement during the period from 2001 to 2007. Implementation of this project assistance by the Government of Tripura commensurated sea changes in the institutional infrastructure resulting into the opening up of 5 (five) more new branches such as Computer Science & Technology, Food Processing Technology, Automobile Engineering, Interior Decoration Handicrafts & Furniture Designing and Modern Office Practice & Management. Huge procurement of equipment and machineries, books and LRs, introduction of new labs and other infrastructure development have multiplied the academic resources of the institute and opened the floodgate before the aspirants for nourishing their academic and technical excellence.

The Institute is administered by Education (Higher) Department, Government of Tripura and is affiliated to the Tripura University. With the introduction of the degree module from the academic session 2007-08 the entire academic control of both degree and diploma would come under Tripura University.

The curricula and other academic control of the Tripura Institute of Technology both of diploma and degree would remain directly under the control of Tripura University from June, 2007. Presently there are eight branches in the diploma module viz. Architectural Assistantship, Automobile Engineering, Civil Engineering, Computer Science &Technology, Electronics & Telecommunication Engineering, Electrical Engineering, Food Processing Technology and Mechanical Engineering. Under the Degree module there are five branches offering Bachelors of Technology (B. Tech) in Civil Engineering, Computer Science & Engineering, Electronics & Communication Engineering, Electrical Engineering and Mechanical Engineering. Many programs in degree module were accredited by the National Board of Accreditation according to the Washington accord.

The Department of Higher Education, Government of Tripura has permitted to start the Master of Technology (M. Tech) course from the academic year 2020-21 in three branches of engineering viz. M.Tech. in Data Science (in CSE department), M.Tech. in VLSI and Embedded Systems (in ECE department), M.Tech. in Thermal Engineering (in ME department). M. Tech. in Power and Energy System in the Department of Electrical Engineering was introduced from this academic year 2021-22.

All programs of the Institute are approved by AICTE and affiliated to Tripura University.

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Vision of the Institution:

To emerge as one of the best Technical Institutes of the Country in creating quality engineers and leaders through excellence in technical education for industries and for the society.

Mission of the Institution:

i. Imparting quality technical education to develop innovative, entrepreneurial and ethical technocrats

ii. Developing collaborative partnership with industries and academia

iii. Developing sustainable technology solutions for the societal needs.

iv. Participative learning in cross-cultural environment that encourages learning beyond the class room

2. About M. Tech. programs:

Applications are invited from eligible candidates for admission to the First Year of the Master of Technology (M.Tech.) programs at Tripura Institute of Technology (TIT), Narsingarh, in the following M. Tech. programs for the Academic Session 2026–27.

Sl. No.	Branch of Engineering	M. Tech. in	No. of Seats
1	Computer Science & Engineering	Data Science	18
2	Electronics & Communication Engineering	VLSI and Embedded Systems	18
3	Mechanical Engineering	Thermal Engineering	18
4	Electrical Engineering	Power and Energy System	18

The M.Tech programs are AICTE recognized and affiliated to Tripura University, Suryamaninagar. The candidates with B.Tech/B.E degree from AICTE approved institutes including in service candidates who fulfill all the eligibility criteria as set forth can apply through proper channel for the said admission test. The candidates who have appeared for B.Tech/B.E examinations can also applying by producing appearing certificate issued by the competent authority. In addition candidates with MCA and M.Sc computer science degree are also eligible to apply in some course.

Duration of course: **2 years (four semesters) in regular mode only**

Two categories of candidates can apply: **i. Regular ii. Sponsored**

Reservation Policy: The allocation of seats against the reservation would be on the basis of the **prevailing reservation policies of the State Government.**

3. Fee Structure for M. Tech courses

Sl. No		Particulars	Frequency	Amount (in Rs.)
01.	a.	Tuition Fee for Regular students	Per semester	25,000.00
	b.	Tuition Fee for Sponsored students	Per semester	50,000.00
02.		Development Fee for sponsored candidate	One time	25,000.00
03.		Library caution Money (refundable)	One time	1,000.00

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04.	Caution money for Laboratory/Workshop etc. (refundable)	One time	1,000.00
05.	Session Charge	Per semester	3,000.00
06.	Internal Examination fee	Per semester	1,000.00
07.	Student Activity fee	Once in a year	500.00
08.	Games, Sports and Cultural Activity, etc. fee	Once in a year	500.00
09.	TIT Alumni Registration fee during 4th semester	One time	200.00
10.	Student Insurance fee	Once in a year	500.00
11.	Student Identity Card Fee	One time	200.00

4. General Information about the Admission Procedure:

I. The M. Tech. programs are approved by AICTE and affiliated to Tripura University.

II. Reservation of seats in each branch will be as per the prevailing norms of Government of Tripura.

III. There are two categories of students: Regular and Sponsored. Out of (18) eighteen seats in each program, six seats are reserved for sponsored category candidates. In case of non-availability of candidates from one particular category, these seats may be allotted to the other category candidates also.

IV. The admission test would be conducted tentatively on **15th July (Wednesday) 2026 (12 noon - 1:30 pm)** at Tripura Institute of Technology (TIT), Narsingarh. The exact date of the Examination will be mentioned in the Admit Card or will be notified in the institute website.

V. **Selection of candidates will be made strictly on a merit basis which will be prepared after conducting test and/or oral interviews. Candidates with valid GATE scores will get first preference followed by candidates with valid CUET (PG) scores as per the following program requirements:**

Sl. No.	M.Tech. Program Name	Subject Name in CUET (PG) with Code
01	VLSI and Embedded Systems	Electronics, Communication and Information Engineering (MTQP05)
02	Data Science	Data Science, Artificial Intelligence, Cyber Security etc. (MTQP04) or Electronics, Communication and Information Engineering (MTQP05)
03	Thermal Engineering	Mechanical Engineering (MTQP07)
04	Power and Energy System	Electrical, Power and Energy Engineering etc. (MTQP10)

Candidates with valid GATE / CUET score need not have to appear for admission test.

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VI. Eligible candidates may apply online in the admission portal in the institute website www.titagartala.ac.in from **22th June 2026 to 07th July 2026.** There will be no provision for physical form submission for the academic year 2026-27.

VII. An amount of Rs. 400/- is to be paid through UPI payment process as application processing fee for the academic session 2026-2027. QR code for payment of processing fee is available in the application form.

VIII. For detailed information please go through the PG admission prospectus, 2026-27 available in the institute website www.titagartala.ac.in

IX. M. Tech. admission related query if any may be communicated to the email: titpgadm2024@gmail.com. Candidates are advised to visit the institute website www.titagartala.ac.in at regular interval to be aware about regular updates.

5. Examination Scheme for TIT P.G. Entrance Examination:

TIT P.G Entrance Examination – 2026 is compulsory for all applicants except candidates with valid GATE / CUET score. The TIT P.G. Entrance Examination (TITPGEE) would consist of one paper of 100 marks and of 1½ hours duration. All the questions will be multiple choice question type. There will be 50 nos. of question with 2 marks each. For each incorrect response (answer) ½ **mark will be deducted. Answers are to be marked by √ symbol and also write the answer in the space provide using Blue Pen only**. There will be separate question papers for all the three specializations. The medium of examination, i.e. setting of question papers will be only in English.

For Valid GATE/CUET Scored Candidates:

i. Candidates with valid GATE/CUET score will get preference over non-GATE candidates
ii. They need not have to appear the TIT P.G. entrance examination.
iii. A valid GATE/CUET score card has to be produced.

6. Eligibility Criteria

a) Common Criteria for all programs

i. Passed B.E./B.Tech or equivalent from AICTE approved Institutions or Institutes established under parliamentary act with at least 50% marks (45% marks in case of candidates belonging to reserved category) in the qualifying examination. There is no age bar for admission.
ii. Sponsored category candidate should have full time work experience of minimum two years and possess sponsorship certificate from his/her present employer.
iii. Sponsored category candidates have to apply either through proper channel submitting an advance copy **or** a "No Objection Certificate" from the employer is to be submitted with the application. However, such candidates have to submit **Release Order** from their parent Department/Organization at the time of admission.
iv. Candidates from other states of the country may also apply, however admission to such candidates may be granted if seats remain vacant after allocation to the candidates from Tripura (having PRTC).
v. Candidates appeared/appearing in final examination of B.E/B. Tech. or equivalent in relevant disciplines are also eligible to apply. Such candidate has to submit a duly signed and stamped certificate to this effect from the competent authority of their institute. Later, they have to produce their B.E./B.Tech. Pass Certificate/Mark-sheet of the respective branch of engineering with requisite percentage of marks positively at the time of counseling, failing which their candidature for such admission will be summarily rejected.
vi. Candidates intending to apply for more than one branch should submit separate application form.

b) Program Specific criteria

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M.Tech. Program	Eligible branch of Engineering in B.E./B.Tech. or Eqv.
Data Science	Computer Science and Engineering, Information Technology, Electronics and Communication Engineering, Electrical & Electronics Engineering. **In addition candidates with MCA and M.Sc computer science degree are also eligible to apply.**
VLSI and Embedded Systems	Electronics & Tele/Communication Engineering, Electronics Engineering, Electrical & Electronics Engineering, Electronics & Instrumentation Engineering
Thermal Engineering	Mechanical Engineering
Power and Energy System	Electrical Engineering, Electrical and Electronics Engineering.

Note: A candidate intending to apply for more than one branch should submit separate application form and a separate merit list of the candidates on the basis of the result of the entrance examination would be published.

7. Submission of Application Form:

(a) An amount of Rs. 400/- as application processing fee for the academic session 2026-2027.

(b) Eligible candidates may apply online in the admission portal in the institute website www.titagartala.ac.in from **22th June 2026 to 07th July 2026**

8. Distribution of Admit Card:

Candidates may be downloaded the admit cards from the institute website www.titagartala.ac.in from **12th July 2026 to 15th July 2026.**

9. Exam Schedule:

Date	Time
15/07/2026 (Wednesday) (Tentative)	**12:00 noon – 1:30 PM**

8. **Venue for Examination:** Mechanical Engineering Department, Tripura Institute of Technology, Narsingarh, Tripura West.

9. **Tentative Date of Publication of Result: 18/07/2026** (Saturday) **at about 4:00 PM in the institute website.**

10. **Tentative Date of Counseling:**
Counselling for allotment of the seats will be held tentatively on **23/07/2026** (Thursday) at Tripura Institute of Technology, Narsingarh, Tripura (West) at about 11:00 AM.
Exact date will be notified through the Institute website www.titagartala.ac.in.

11. Address for Communication:

Chairperson, TITPGEE-2026
Tripura Institute of Technology, Narsingarh
PO: Narayanpur Bazar, Pin-799015, Tripura (W)
Website: www.titagartala.ac.in
Email: titpgadm2024@gmail.com
Phone: 0381-2342330

12. Important Instructions for Candidates:

1) Carefully filled up the application form and upload all the documents in prescribed format as instructed. Incomplete application form may be rejected for which institute will not remain liable.

2) Mobile Phones, Programmable Calculators, Pagers, Programmable Electronic Watches etc. are not allowed inside the Examination Rooms / Halls. Candidates are requested not to bring these kinds of belongings as TITPGEE 2026 Committee will not take any responsibility for the safety of those things.

3) During examination, candidates are instructed to answer only by using **BLUE Ball Pen**. Answer script will not be considered if answered by using different ink or by pencil.

4) Provide email and phone number in your application form for regular communication.

5) Visit the institute website www.titagartala.ac.in at regular interval to be aware about regular updates.

6) The answers attempted must be ticked using (√) symbol **as well written in the space** provided **BLUE Ball Pen**.

7) Without Admit Card no candidate will be allowed inside the Examination Centre.

8) Candidates will be permitted to enter into the respective class room at **11:45 AM** where his/her seat is allotted.

9) Once entered inside the allotted room, candidates would not be allowed to leave the room permanently before the completion of examination duration.

10) For any query email at titpgadm2024@gmail.com

13. Important Dates (Tentative) to Remember:

Sl. No.	Date (tentative)	Day	Program
1	**22th June 2026 to 07th July 2026**	Monday to Tuesday	Online application form available in institute website www.titagartala.ac.in
2	**07th July 2026 (12-3pm).**	Tuesday	Last date of online submission.
2	**10th July to 15th July, 2026**	Friday to Wednesday	Download of Admit Card
3	**15th July 2026**	Wednesday	Examination [From 12:00 Noon to 01:30 PM].
4	**18th July 2026**	Saturday	Result publication.
5	**23rd July 2026**	Thursday	Counseling for TITLPGEE – 2026

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14. Syllabus of TIT P.G. Entrance Examination-2026:

[A]. Syllabus for Computer Science and Engineering (Data Science)

Section 1: Digital Logic

Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

Section 2: Computer Organization and Architecture

Machine instructions and addressing modes. ALU, data path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Section 3: Programming and Data Structures

Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Section 4: Algorithms

Searching, sorting, hashing. Asymptotic worst-case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide and conquer. Graph search, minimum spanning trees, and shortest paths.

Section 5: Theory of Computation

Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.

Section 6: Compiler Design

Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation.

Section 7: Operating System

Processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU scheduling. Memory management and virtual memory. File systems.

Section 8: Databases

ER model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Section 9: Computer Networks

Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.

[B]. Syllabus of Electronics and Communication Engineering (VLSI and Embedded Systems)

Section 1: Networks, Signals and Systems

Network solution methods: nodal and mesh analysis; Network theorems: superposition, Thevenin and Norton's, maximum power transfer; Wye Delta transformation; Steady state sinusoidal analysis using phasors; Time domain analysis of simple linear circuits; Solution of network equations using Laplace transform; Frequency domain analysis of RLC circuits; Linear 2, port network parameters: driving point and transfer functions; State equations for networks.

Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT, Z-transform, interpolation of discrete-time signals; LTI systems: definition and properties, causality, stability, impulse

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response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay, digital filter design techniques.

Section 2: Electronic Devices

Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations; P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell; Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography and twin-tub CMOS process.

Section 3: Analog Circuits

Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing, bias stability, mid-frequency small signal analysis and frequency response; BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational; Simple op-amp circuits; Active filters; Sinusoidal oscillators: criterion for oscillation, single-transistor and op-amp configurations; Function generators, wave-shaping circuits and 555 timers; Voltage reference circuits; Power supplies: ripple removal and regulation.

Section 4: Digital circuits

Number systems; Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders and PLAs; Sequential circuits: latches and flip flops, counters, shift registers and finite state machines; Data converters: sample and hold circuits, ADCs and DACs; Semiconductor memories: ROM, SRAM, DRAM; 8-bit microprocessor (8085): architecture, programming, memory and I/O interfacing.

Section 5: Control Systems

Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation of LTI systems.

Section 6: Communications

Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems; Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, super heterodyne receivers, circuits for analog communications; Information theory: entropy, mutual information and channel capacity theorem;

Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying(ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation; Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.

Section 7: Electromagnetics

Electrostatics; Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector;
Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth; Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart;

Waveguides: modes, boundary conditions, cut-off frequencies, dispersion relations;
Antennas: antenna types, radiation pattern, gain and directivity, return loss, antenna arrays; Basics of radar; Light propagation in optical fibers.

[C]. Syllabus for Mechanical Engineering (Thermal Engineering)

Section 1: Applied Mechanics and Design

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Engineering Mechanics: Free-body diagrams and equilibrium; friction and its applications including rolling friction, belt-pulley, brakes, clutches, screw jack, wedge, vehicles, etc.; trusses and frames; virtual work; kinematics and dynamics of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations; Lagrange's equation.

Mechanics of Materials: Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; concept of shear centre; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.

Theory of Machines: Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.

Vibrations: Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts.

Machine Design: Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears, rolling and sliding contact bearings, brakes and clutches, springs.

Section 2: Fluid Mechanics and Thermal Sciences

Fluid Mechanics: Fluid properties; fluid statics, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings; basics of compressible fluid flow.

Heat-Transfer: Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan- Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis

Thermodynamics: Thermodynamic systems and processes; properties of pure substances, behavior of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.

Applications: Power Engineering: Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning: Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychometric processes. Turbo machinery: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines; steam and gas turbines.

Section 3: Materials, Manufacturing and Industrial Engineering

Engineering Materials: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials

Casting, Forming and Joining Processes: Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.

Machining and Machine Tool Operations: Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, jigs and fixtures.

Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing
and assembly.

Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools.

Production Planning and Control: Forecasting models, aggregate production planning, scheduling, materials requirement planning.

Inventory Control: Deterministic models; safety stock inventory control systems.

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Operations Research: Linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM

[D]. Syllabus for Electrical Engineering (Power and Energy System)

Section 1: Engineering Mathematics

Linear Algebra: Matrix Algebra, Systems of linear equations, Eigen values, Eigenvectors.
Calculus: Mean value theorems, Theorems of integral calculus, Evaluation of definite and improper integrals, Partial Derivatives, Maxima and minima, Multiple integrals, Fourier series, Vector identities, Directional derivatives, Line integral, Surface integral, Volume integral, Stokes's theorem, Gauss's theorem, Divergence theorem, Green's theorem. Differential equations: First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's equation, Euler's equation, Initial and boundary value problems, Partial Differential Equations, Method of separation of variables.
Complex variables: Analytic functions, Cauchy's integral theorem, Cauchy's integral formula, Taylor series, Laurent series, Residue theorem, Solution integrals. Probability and Statistics: Sampling theorems, Conditional probability, Mean, Median, Mode, Standard Deviation, Random variables, Discrete and Continuous distributions, Poisson distribution, Normal distribution, Binomial distribution, Correlation analysis, Regression analysis.

Section 2: Electric circuits

Network elements: ideal voltage and current sources, dependent sources, R, L, C, M elements; Network solution methods: KCL, KVL, Node and Meshanalysis; Network Theorems: Thevenin's, Norton's, Superposition and Maximum Power Transfer theorem; Transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, two port networks, balanced three phase circuits, star-delta transformation, complex power and power factor in ac circuits.

Section 3: Electromagnetic Fields

Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane and spherical charge distributions, Effect of dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law,Curl, Faraday's law, Lorentz force, Inductance, Magneto motive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations.

Section 4: Signals and Systems

Representation of continuous and discrete time signals, shifting and scaling properties, linear time invariant and causal systems, Fourier series representation of continuous and discrete time periodic signals, sampling theorem, Applications of Fourier Transform for continuous and discrete time signals, Laplace Transform andZ transform. R.M.S. value, average value calculation for any general periodic waveform

Section 5: Electrical Machines

Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three-phase transformers: connections, vector groups, parallel operation; Auto-transformer, Electromechanical energy conversion principles; DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics, speed control of dc motors; Three-phase induction machines: principle of operation, types, performance, torque-speed characteristics, no-load and blocked-rotor tests, equivalent circuit, starting and speed control; Operating principle of single-phase induction motors; Synchronous machines: cylindrical and salient pole machines, performance and characteristics, regulation and parallel operation of generators, starting of synchronous motors; Types of losses and efficiency calculations of electric machines.

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Section 6: Power Systems

Basic concepts of electrical power generation, ac and dc transmission concepts, Models and performance of transmission lines and cables, Economic LoadDispatch (with and without considering transmission losses), Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Bus admittance matrix, Gauss- Seidel and Newton-Raphson load flow methods, Voltage and Frequency control, Power factor correction, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of over-current, differential, directional and distance protection; Circuit breakers, System stability concepts, Equal area criterion.

Section 7: Control Systems

Mathematical modeling and representation of systems, Feedback principle, transfer function, Block diagrams and Signal flow graphs, Transient and Steady-state analysis of linear time invariant systems, Stability analysis using Routh-Hurwitz and Nyquist criteria, Bode plots, Root loci, Lag, Lead and Lead-Lag compensators; P, PI and PID controllers; State space model, Solution of state equations of LTI systems

Section 8: Electrical and Electronic Measurements

Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; Instrument transformers, Digital voltmeters and multimeters, Phase, Time and Frequency measurement; Oscilloscopes, Error analysis.

Section 9: Analog and Digital Electronics

Simple diode circuits: clipping, clamping, rectifiers; Amplifiers: biasing, equivalent circuit and frequency response; oscillators and feedback amplifiers; operational amplifiers: characteristics and applications; single stage active filters, Active Filters: Sallen Key, Butterwoth, VCOs and timers, combinatorial and sequential logiccircuits, multiplexers, demultiplexers, Schmitt triggers, sample and hold circuits, A/Dand D/A converters.

Section 10: Power Electronics

Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET, IGBT; DC to DC conversion: Buck, Boost and Buck-Boost Converters; Single and three-phase configuration of uncontrolled rectifiers; Voltage and Current commutated Thyristor based converters; Bidirectional ac to dc voltage source converters; Magnitude and Phase of line current harmonics for uncontrolled and thyristor based converters; Power factor and Distortion Factor of ac to dc converters; Single-phase and three-phase voltage and current source inverters, sinusoidal pulse width modulation

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Prof. Bijoy Kumar Upadhyaya
Principal In-Charge,
Techno India Institute of Technology,
Kolkata