MGM University
MGM University Campus,
N-6, CIDCO,
Chhatrapati Sambhajinagar 431003

MGMU-CET 2025
Information Booklet
for
Admission to FY B.Tech,
FY B.Tech (Integrated), M.Tech (Integrated) Programs
(Academic Year 2025-26)

in

Jawaharlal Nehru Engineering College (JNEC),

School of Engineering and Technology (SoET),

&

University Department of Information and Communication Technology (UDICT)

Website: https://www.mgmu.ac.in
https://www.jnec.org
https://udict.mgmu.ac.in
https://soet.mgmu.ac.in

MGMU-CET 2025 Information Booklet

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1. Admission to B.Tech. Programmes for Academic Year 2025-2026

Jawaharlal Nehru Engineering College (JNEC), MGM University, Chhatrapati Sambhajinagar invites applications to its Four Years on-campus B.Tech Under Graduation programs for the academic year 2025-2026. Admissions are open for the following programs to be offered by MGM University, Chhatrapati Sambhajinagar.

UG Programs

Name of The Program	Approved Intake	Duration
B.Tech. Artificial Intelligence and Data Science	60	4 Years
B.Tech. Chemical Engineering	30	4 Years
B.Tech. Civil Engineering	60	4 Years
B.Tech. Computer Science and Engineering	240	4 Years
B.Tech. Electronics and Computer Engineering	60	4 Years
B.Tech. Electrical and Computer Engineering	60	4 Years
B.Tech. Mechanical Engineering	30	4 Years
B.Tech. Mechanical and Mechatronics Engineering(Additive Manufacturing)	30	4 Years
B.Tech. Robotics and Artificial Intelligence	60	4 Years

2. Admission to B.Tech. and B.Tech. (Integrated-Six Years) Programmes for Academic Year 2025-2026

School of Engineering and Technology (SOET), MGM University, Chhatrapati Sambhajinagar invites applications to its on-campus B.Tech.(Four Years) and B.Tech. (Integrated- Six Years) Under Graduation Programs for the Academic Year 2025-2026. Admissions are open for the following programs to be offered by MGM University, Chhatrapati Sambhajinagar.

UG (Integrated) Programs (Six Years Program)

Name of The Program	Approved Intake	Duration
B.Tech. (Integrated) Civil Engineering with Computer Applications	30	6 Years
B.Tech. (Integrated) Computer Science and Engineering (Data Science)	60	6 Years

B.Tech. (Integrated) Computer Science and Engineering (Internet of Things, Cyber Security Including Block Chain Technology)	30	6 Years
B.Tech. (Integrated) Electrical and Computer Engineering	30	6 Years
B.Tech. (Integrated) Robotics and Artificial Intelligence	60	6 Years

UG Programs (Four Years Program)

Name of The Program	Approved Intake	Duration
B.Tech. Computer Science and Engineering (Internet of Things, Cyber Security Including Block Chain Technology)	90	4 Years
B.Tech. Computer Science and Engineering (Cyber Security)	30	4 Years
B.Tech. Electronics Engineering (VLSI Design and Technology)	30	4 Years
B.Tech. Robotics and Automation	30	4 Years

3. Admission to B.Tech. Programs for Academic Year 2025-2026

University Department of Information and Communication Technology (UDICT), MGM University, Chhatrapati Sambhajinagar invites applications to its Four Years on-campus B.Tech. Under Graduation programs for the academic year 2025-2026. Admissions are open for the following programs to be offered by MGM University, Chhatrapati Sambhajinagar.

UG Programs

Name of The Program	Approved Intake	Duration
B.Tech. Information Technology (with specializations in IoT, Block chain and Big Data Analytics)	240	4 Years
B.Tech. Artificial Intelligence and Machine Learning	120	4 Years
B.Tech. Data Science	60	4 Years

4. Examination Schedule for MGMU-CET-2025

Important Information for Online Entrance Examination(The mode of examination will be online through ERP, but candidate has to come on campus physically to appear for this

online examination.)

Online registration & Confirmation of Application form on website	Already started
Application and MGMU-CET-2025 Examination Fees ₹.1500/-	Pay only through online mode(ERP)
Tentative Date and Time	16th May 2025 11:00 AM to 2:00 PM
Duration of Examination	03 Hours.

EXAMINATION SCHEDULE

Activity	**Time**
Login to ERP module	10.30 AM
First Login to read the instructions	10:50 AM
Commencement of Online Examination	11:00 AM
End of Online Examination	02:00 PM

Submission of objections on Question Paper	Within 24 hrs. after the examination is over
Declaration of Result	Candidates can check their results in ERP through their credentials.

5. INTRODUCTION

The MGM University Chhatrapati Sambhajinagar has established "ADMISSION REGULATING AUTHORITY and In-charge COMMON ENTRANCE TEST CELL" as per the MGM University Aurangabad, Maharashtra Act No.XXVI of 2019).

The In-charge of MGMU-CET-2025, appointed by the competent authority, is authorized to conduct MGMU-CET-2025 for the Academic Year 2025-26.

The Registrar, MGM University Chhatrapati Sambhajinagar has notified the rules to regulate the admissions to the First Year of Full Time Professional Undergraduate Technical programs (Engineering and Technology). The admissions shall be carried out as per these rules and its amendment from time to time.

The In-charge MGMU-CET-2025 cell, shall act as Nodal Officer for the MGMU-CET-2025

6. DEFINITIONS

(a) "Act" means the MGM University, Aurangabad (Regulation of admission and fees) Act, 2019 Act XXVI of 2019.

(b) "All India Seats"means seats available to an eligible Indian National Candidate;

(c) "Application Form" means prescribed form filled up online by the Candidate for admission;

(d) "Competent Authority" means the Registrar, MGM University Chhatrapati Sambhajinagar.

(e) "Program" means the undergraduate technical courses in Engineering and Technology.

(f) "Eligible Candidates' ' means the candidates who are eligible for admission to different professional courses as notified by the MGMU, Chhatrapati Sambhajinagar.

(g) "HSC" means the Higher Secondary School Certificate (Standard XII) examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education or its equivalent certificate awarded by a recognized Boards;

(h) "Inter-Se-Merit" means the order of merit in respect of various classes/category of Candidates;

(i) "Qualifying Examination" means examinations on the basis of which a candidate becomes eligible for admission or its equivalent examination;

(j) "SSC" means the Secondary School Certificate (Standard X) examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education or its equivalent certificate awarded by a recognized Boards;

7. SCHEME OF EXAMINATION

The examination will be conducted in "Online mode through ERP", but students have to come on campus physically to appear for this online examination across Maharashtra as well as outside Maharashtra State.

Weightage and Pattern of Examination:

MGMU-CET-2025 will be conducted for PCM group (Physics, Chemistry and Mathematics). The question paper has multiple choice questions (MCQ) having 4 options. There will be no Negative Marking. The questions will be mainly application based. No marks are awarded for questions not attempted. The questions will be selected at random from a large question bank. All the questions and instructions of the test will be in English only.

The number of questions and marking system is as follows:

Subject	Number of Multiple- Choice Questions (MCQ)	Mark(s) per Question	Total Marks	Duration in Minutes
Mathematics	50	2	100	90
Physics	50	1	100	90
Chemistry	50			
		Total	200	180

8. SYLLABUS FOR MGMU-CET-2025 EXAMINATION:

The MGMU-CET-2025 will be conducted based on syllabus of Physics, Chemistry and

Mathematics subjects. The detailed syllabus for MGMU-CET-2025 is as follows,

MATHEMATICS

UNIT1: SETS, RELATIONS AND FUNCTIONS:

Sets and their representation: Union, intersection and complement of sets and their algebraic properties; Power set; Relation, Type of relations, equivalence relations, functions; one-one, into and onto functions, the composition of functions.

UNIT2: COMPLEX NUMBERS AND QUADRATIC EQUATIONS:

Complex Numbers As Ordered Pairs of Reals, Representation Of Complex Numbers Theform $a + ib$and their representation in a plane, Argand diagram, algebra of complex number, modulus and argument (or amplitude) of a complex number, square root of a complex number, triangle inequality, Quadratic equations in real and complex number system and their solutions Relations between roots and coefficient, nature of roots, the formation of quadratic equations with given roots.

UNIT3: MATRICES AND DETERMINANTS:

Matrices, algebra of matrices, type of matrices, determinants and matrices of order two and three, properties of determinants, evaluation of determinants, area of triangles using determinants, Adjoint and evaluation of inverse of a square matrix using determinants and elementary transformations, Test of consistency and solution of simultaneous linear equations in two or three variables using determinants and matrices.

UNIT4: PERMUTATIONS AND COMBINATIONS:

The fundamental principle of counting, permutation as an arrangement and combination as section, Meaning of $P\ (n,r)$and$C\ (n,r)$simple applications.

UNIT5: BINOMIAL THEOREM AND ITS SIMPLE APPLICATIONS:

Binomial theorem for a positive integral index, general term and middle term, properties of Binomial coefficients and simple applications.

UNIT6: SEQUENCE AND SERIES:

Arithmetic and Geometric progressions, insertion of arithmetic, geometric means between two given numbers, Relation between A.M and G.M sum upto n terms of special series;
$Sn, Sn2, Sn3$. Arithmetico-Geometric progression.

UNIT7: LIMIT, CONTINUITY AND DIFFERENTIABILITY:

Real–valued functions, algebra of functions, polynomials, rational, trigonometric, logarithmic and exponential functions, inverse function. Graphs of simple functions.Limits, continuity and differentiability. Differentiation of the sum, difference, product and quotient of two functions. Differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite and implicit functions; derivatives of order up to two, Rolle's and Lagrange's Mean value Theorems, Applications of derivatives: Rate of change of quantities, monotonic Increasing and decreasing functions, Maxima and minima of functions of one variable,tangents and normal.

UNIT8: INTEGRAL CALCULUS:

Integral asananti-derivative, Fundamental Integrals involving algebraic, trigonometric, exponential and logarithmic functions. Integrations by substitution, by parts and by partial functions. Integration using trigonometric identities.

Evaluation of simple integrals of the type

$\int \frac{dx}{x^2+a^2}$, $\int \frac{dx}{\sqrt{x^2 \pm a^2}}$, $\int \frac{dx}{a^2-x^2}$, $\int \frac{dx}{\sqrt{a^2-x^2}}$, $\int \frac{dx}{ax^2+bx+c}$, $\int \frac{dx}{\sqrt{ax^2+bx+c}}$, $\int \frac{(px+q)dx}{ax^2+bx+c}$, $\int \frac{(px+q)dx}{\sqrt{ax^2+bx+c}}$,

$\int \sqrt{a^2 \pm x^2}\, dx, \int \sqrt{x^2 - a^2}\, dx$

Integral as the limit of a sum. The fundamental theorem of calculus, properties of definite integrals. Evaluation of definite integrals, determining areas of the regions bounded by simple curves in standard form.

UNIT9: DIFFERENTIAL EQUATIONS:

Ordinary differential equations, their order and degree, the formation of differential equations,solution of differential equation by the method of separation of variables,solution of homogeneous and linear differential equation of the type

$\frac{dy}{dx} + p(x) = q(x)$

UNIT10:COORDINATE GEOMETRY:

Cartesian system of rectangular coordinates in a plane, distance formula, sections formula, locus and its equation,translation of axes,the slope of a line,parallel and perpendicular lines,interceptsof alineon theco-ordinateaxis.

Straight Line

Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, the distance of a point form a line, equations of internal andexternal by sectors of angles between two lines coordinate of the centroid, orthocentre and circum-center of a triangle,equation of the family of lines passing through the point of intersection of two lines.

Circle,conic sections

A standard form of equations of a circle, the general form of the equation of a circle, its radius and central,equation of circle when the endpoints a diameter are given, points of intersection of a line and a circle with the center at the origin and condition for a line to be tangent to a circle, equation of the tangent, sections of conics, equations of conic sections(parabola,ellipse and hyperbola) in standard forms, condition for

$Y = mx + c$to be a tangent and point(s) of tangency.

UNIT 11:THREE DIMENSIONAL GEOMETRY:

Coordinates of a point in space, the distance between two points, section formula, direction ratios and direction cosines, the angle between two intersecting lines. Skew lines, the shortest distance between them and its equation. Equations of a line and a plane in different forms, the intersection of line and a plane,coplanar lines.

UNIT 12: VECTOR ALGEBRA:

Vectors and scalars, the addition of vectors, components of a vector in two dimensions and three-dimensional space,scalar and vector products,scalar and vector triple products.

UNIT 13: STATISTICS AND PROBABILITY:

Measures Of Discretion;calculation of mean,median,mode grouped and ungrouped data calculation of standard deviation, variance and mean deviation for grouped and ungrouped data.Probability:Probability of an event, addition and multiplication theorems of probability, Bayes theorem, probability distribution of random variate, Bernoulli trials and binomial distribution.

UNIT 14: TRIGONOMETRY:

Trigonometric Identities Equations,trigonometric functions,inverse trigonometric functions and their properties, heights and distance.

PHYSICS

UNIT1: PHYSICS AND MEASUREMENT:

Physics, technology and society, S I Units, fundamental and derived units, least count, accuracy and precision of measuring instruments, Errors in measurement, Dimensions of Physical quantities, dimensional analysis and its applications.

UNIT2: KINEMATICS:

The frame of reference, motion in a straight line, Position- time graph, speed and velocity;Uniform Non-uniform motion,average speed and instantaneous velocity,uniformly accelerated motion,velocity-time,position-time graph,relations for uniformly accelerated motion, Scalars and Vectors, Vector. Addition and subtraction, zero vector, scalar and vector products, Unit Vector, Resolution of a Vector. Relative Velocity, Motion in a plane, Projectile Motion,Uniform Circular Motion.

UNIT3: LAWS OF MOTION:

Force and inertia, Newton's First law of motion; Momentum, Newton's Second Law of motion,Impulses; Newton's Third Law of motion.Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and Kinetic friction, laws of friction,rolling friction. Dynamics Of Uniform Circular Motion:centripetal force and its applications.

UNIT4: WORK, ENERGY AND POWER:

Work done by a content force and a variable force; kinetic and potential energies, work-energy theorem, power.The potential energy of spring conservation of mechanical energy, conservative and nonconservative forces; Elastic And inelastic collisions in one and two dimensions.

UNIT5:ROTATIONAL MOTION

Centre of the mass of a two-particle system, Centre of the mass of rigidbody; Basic Concepts Of Rotational motion; a moment of a force; torque, angular momentum, conservation of angular momentum and its applications; the moment of inertia,the radius of gyration.

Values of moments of inertia for simple geometrical objects, parallel and perpendicular axes theorems and their applications. Rigid body rotation equations of rotational motion.

UNIT 6: GRAVITATION:

The universal law of gravitation.Acceleration due to gravity and its variation with altitude and depth. Kepler's law of planetary motion. Gravitational potential energy; gravitational potential. Escape Velocity, Orbital velocity of satellite. Geostationary satellites.

UNIT 7: PROPERTIES OF SOLIDS AND LIQUIDS:

Elastic behavior, Stress-strain relationship, Hooke's Law.Young's modulus, bulk modulus,modulus of rigidity.Pressure due to a fluid column; Pascal's law and its applications.Viscosity.Stokes Law.terminal velocity, streamline and turbulent flow.Reynolds number. Bernoulli's Principle and its applications.Surface energy and surface tension, angle of contact, application of surface tension - drops, bubbles and capillary rise. Heat, temperature, thermal expansion; specific heat capacity, calorimetry; change of state, latent heat.Heat transfer-conduction, convection and radiation. Newton's law of cooling.

UNIT 08: OSCILLATIONS AND WAVES:

Periodic motion - period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion(S.H.M.)anditsequation;phase:oscillations ofaspring-restoringforce and force constant: energy in S.H.M. - Kinetic and potential energies; Simple pendulum -derivation of expression for its time period:Free,forced and damped oscillations,resonance.

Wave motion. Longitudinal and transverse waves, speed of a wave. Displacement relation for a progressive wave.Principle of superposition of waves, a reflection of waves.Standing waves in strings and organ pipes, fundamental mode and harmonics. Beats.Doppler Effect in sound.

UNIT 09: ELECTROSTATICS:

Electric charges: Conservation of charge. Coulomb's law-forces between two-point charges,forces between multiple charges:superposition principle and continuous charge distribution. Electric field: Electric field due to a point charge, Electric field lines. Electric dipole, Electric field due to a dipole. Torque on a dipole in a uniform electric field.

Electric flux. Gauss's law and its applications to find fields due to infinitely long uniformly charged straight wire,uniformly charged infinite plane sheet and uniformly charged thin spherical shell. Electric potential and its calculation for a point charge, electric dipole and system of charges; Equipotential surfaces, Electrical potential energy of a system of two-point charges in an electrostatic field.

Conductors and insulators.Dielectrics and electric polarization, capacitor, the combination of capacitors in series and parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates. Energy stored in a capacitor.

UNIT 10: CURRENT ELECTRICITY:

Electric current. Drift velocity.Ohm's law. Electrical resistance. Resistances of different materials.V-l characteristics of Ohmic and non-ohmic conductors.Electrical energy and power.Electrical resistivity. Colour code for resistors; Series and parallel combinations of resistors;Temperature dependence of resistance.

Electric Cell and its Internal resistance, potential difference and emf of a cell, a combination of cells in series and parallel. Kirchhoff's laws and their applications.Wheatstone bridge.Metre Bridge. Potentiometer - principle and its applications.

UNIT11: MAGNETIC EFFECTS OF CURRENT AND MAGNETISM:

Biot - Savart law and its application to current carrying circular loop.Ampere's law and its applications to infinitely long current carrying straight wire and solenoid. Force on a moving charge in uniform magnetic and electric fields.Cyclotron.

Force on a current-carrying conductor in a uniform magnetic field. The force between two parallel current carrying conductors- definition of ampere. Torque experienced by a current loop in a uniform magnetic field:Moving coil galvanometer, its current sensitivity and conversion to ammeter and voltmeter. Current loop as a magnetic dipole and its magnetic dipole moment. Bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements. Para-, dia- and ferromagnetic substances. Magnetic susceptibility and permeability. Hysteresis. Electromagnets and permanent magnets.

UNIT12: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENTS:

Electromagnetic induction: Faraday's law. Induced emf and current: Lenz's Law, Eddy currents.Self and mutual inductance. Alternating currents, peak and RMS value of alternating current/voltage: reactance and impedance: LCR series circuit, resonance: Quality factor, power in AC circuits, wattless current. AC generator and transformer.

UNIT13: ELECTROMAGNETIC WAVES:

Electromagnetic waves and their characteristics, Transverse nature of electromagnetic waves, Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet. X-rays.Gamma Rays), Applications of e.m. waves.

UNIT 14: OPTICS:

Reflection and refraction of light at plane and spherical surfaces, mirror formula.Total internal reflection and its applications.Deviation and Dispersion of light by a; prism; Lens Formula.Magnification.Power of a Lens. Combination of thin lenses in contact. Microscope and Astronomical Telescope (reflecting and refracting) and their magnifying powers.

Wave optics: wave front and Huygens 'principle.Laws of reflection and refraction using Huygens principle. Interference, Young's double-slit experiment and expression for fringe width, coherent sources and sustained interference of light. Diffraction due to a single slit, width of central maximum. Resolving power of microscopes and astronomical telescopes. Polarization, plane-polarized light:Brewster's law, uses of plane-polarized light and Polaroid.

UNIT15: DUAL NATURE OF MATTER AND RADIATION

Dual Nature Of Radiation. Photoelectric Effect.Hertzand Lenard's observations; Einstein's Photoelectric equation: particle nature of light. Matter waves-wave nature of particles, de Broglie relation. Davisson-Germer experiment.

UNIT16: ATOMS AND NUCLEI

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels,hydrogen spectrum. Composition and size of nucleus, atomic masses, isotopes, isobars: isotones.Radioactivity- alpha.beta and gamma particles/rays and their properties; radioactive decay law.Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number,nuclear fission and fusion.

UNIT 17: ELECTRONIC DEVICES

Semiconductors; semiconductor diode: 1- V characteristics in forward and reverse bias; diode as a rectifier; I-V characteristics of LED. the photodiode, solar cell and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor: transistor as an amplifier (common emitter configuration) and oscillator. Logic gates (OR.AND. NOT.NANDand NOR). Transistor as a switch.

UNIT18:COMMUNICATION SYSTEMS

Propagation of electromagnetic waves in the atmosphere; Sky and space wave propagation. Need For modulation. Amplitude and Frequency Modulation, Bandwidth of signals.the bandwidth of Transmission medium, Basic Elements of a Communication System (Block Diagram only).

CHEMISTRY

UNIT1: STATES OF MATTER:

Matter and its nature,Dalton's Atomic Theory:Concept Of Atom,molecule,element and compound: Physical quantities and their measurements in chemistry, precision and accuracy,significant figures. S. I. Units, dimensional analysis: Laws of chemical combination; Atomic and molecular masses, mole concept, molar mass, percentage composition, empirical and molecular formulae: Chemical Equations And Stoichiometry.

Classification Of Matter Into Solid,liquid and gaseous states.

Gaseous State: Measurable properties of gasses: Gas laws - Boyle's law, Charle's law. Graham's Law of diffusion, Avogadro's law, Dalton's law of partial pressure; Concept of Absolute scale of temperature; Ideal gas equation; Kinetic theory of gases (only postulates); Concept of average,root mean square and most probable velocities;Real Gases, deviation from Ideal behavior,compressibility factor and van der Waals equation.

Liquid State: Properties of liquids - vapor pressure, viscosity and surface tension and effect of temperature on them (qualitative treatment only).

Solid State: Classification of solids: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea); Bragg's Law and its applications: Unit cell and lattices,packing in solids (fcc, bcc and hcp lattices), voids, calculations involving unit cell parameters, an imperfection in solids;Electrical And Magnetic Properties.

UNIT2: ATOMIC AND MOLECULAR STRUCTURE:

Thomson and Rutherford atomic models and their limitations;Nature Of Electromagnetic Radiation, photoelectric effect; Spectrum of the hydrogen atom. Bohr model of a hydrogen atom -its postulates, derivation of the relations for the energy of the electron and radii of the different orbits, limitations of Bohr's model; Dual nature of matter, de Broglie's relationship. Heisenberg uncertainty principle.Elementary ideas of quantum mechanics,quantum mechanics,the quantum mechanical model of the atom,its important features. Concept of atomic orbitals as one-electron wave functions: Variation of ψ and ψ^2 with r for 1s and 2s orbitals; various quantum numbers (principal, angular momentum and magnetic quantum numbers) and their significance; shapes of s, p and d - orbitals, electron spin and spin quantum number: rules for filling electrons in orbitals-Aufbau principle, Pauli's exclusion principle and Hund's Rule,electronic configuration of elements,extra stability of half-filled and completely filled orbitals.

Chemical Bonding And Molecular Structure: Kossel-Lewis Approach Chemical Bond Formation, the concept of ionic and covalent bonds.

Ionic Bonding:Formation of Ionic Bonds, factors affecting the formation of ionic bonds;calculation of lattice enthalpy.

Covalent bonding: Concept of electronegativity, Fajan's rule, dipole moment: Valence Shell Electron pair repulsion (VSEPR) theory and shapes of simple molecules.

Quantum mechanical approach to covalent bonding: Valence bond theory - its important features,the concept of hybridization involving s, p and d orbitals; Resonance.

Molecular orbital theory - Its important features are LCAOs, types of molecular orbitals (bonding,antibonding), sigma and pi-bonds, molecular orbital electronic configurations of homonuclear diatomic molecules, the concept of bond order, bond length and bond energy. Elementary idea of metallic bonding. Hydrogen Bonding And its applications.

UNIT3:THERMODYNAMICS:

Basic concepts: System and surroundings, extensive and intensive properties, state functions,types of processes.

The first law of thermodynamics - Concept of work, heat internal energy and enthalpy, heat capacity, molar heat capacity; Hess's law of constant heat summation; Enthalpies of bond dissociation, combustion, formation, atomization, sublimation,phase transition, hydration, ionization and solution. The Second Law Of Thermodynamics-Spontaneity Of Processes;ΔS of the universe and ΔG of the system as criteria for spontaneity.ΔG°(Standard Gibbs Energy Change)an equilibrium constant.

UNIT4:PHYSICAL AND CHEMICAL EQUILIBRIA:

Different methods for expressing the concentration of solution–molality,molarity, mole fraction, percentage(by volume and mass both),the vapor pressure of solutions and Raoult'sLaw - Ideal and non-ideal solutions, vapor pressure - composition, plots for ideal and non-ideal solutions; Colligative properties of dilute solutions-a relative lowering of vapor pressure,depression of freezing point, the elevation of boiling point and osmotic pressure; Determination of molecular mass using colligative properties; Abnormal value of molar mass, Van't Hoff factor and its significance.

Equilibrium:Meaning of Equilibrium,the concept of dynamic equilibrium.

Physical equilibrium: Solid-liquid, liquid - gas and solid-gas equilibria, Henry's law. General Characteristics of equilibrium involving physical processes.

Chemical equilibrium: Law of chemical equilibrium, equilibrium constants (Kp and Kc) and their significance, the significance of ΔG and ΔG° in chemical equilibrium, factors affecting equilibrium concentration, pressure,temperature, the effect of catalyst; LeChatelier'sprinciple.

Ionic equilibrium: Weak and strong electrolytes, ionization of electrolytes, various concepts of acids and bases (Arrhenius. Bronsted-Lowry and Lewis) and their ionization, acid-base equilibria(including multi stage ionization)an ionization constants,ionization of water.pH scale,common ion effect, hydrolysis of salts and pH of their solutions, the solubility of sparingly soluble salts and solubility products,buffer solutions.

UNIT5: REDOX REACTIONS AND ELECTROCHEMISTRY:

Electronic concepts of oxidation and reduction, redox reactions, oxidation number, rules for assigning oxidation number, balancing of redox reactions.

Electrolytic and metallic conduction, conductance in electrolytic solutions, molar conductivities and their variation with concentration:Kohlrausch's law and its applications.

Electrochemical cells - Electrolytic and Galvanic cells, different types of electrodes, electrode potentials including standard electrode potential, half - cell and cell reactions, emf of a galvanic cell and its measurement:Nernst equation and its applications;Relationship between cell potential Gibbs' energy change:Dry cell and lead accumulator;Fuel Cells.

UNIT6:CHEMICAL KINETICS:

Rate of a chemical reaction, factors affecting the rate of reactions: concentration, temperature,pressure and catalyst; elementary and complex reactions, order and molecularity of reactions, rate law, rate constant and its units, differential and integral forms of zero and first-order reactions,their characteristics and half-lives, the effect of temperature on the rate of reactions, Arrhenius theory, activation energy and its calculation,collision theory of bimolecular gaseous reactions (no derivation).

Surface Chemistry:Adsorption-physisorption and chemisorptions and their characteristics,factors affecting adsorption of gases on solids - Freundlich and Langmuir adsorption isotherms,adsorption from solutions.Catalysis:Homogeneous and heterogeneous, activity and selectivity of solid catalysts, enzyme catalysis and its mechanism. Colloidal state: distinction among true solutions,colloids suspensions,classification of colloids-lyophilic, lyophobic; multimolecular, macromolecular and associated colloids (micelles), preparation and properties of colloids-Tyndall Effect.Brownian Movement,electrophoresis, dialysis, coagulation and flocculation: Emulsions and their characteristics.

UNIT7:PROPERTIES OF ELEMENTS AND ISOLATION OF METALS:

Classification of elements and periodicity in properties: Modem periodic law and present form of the periodic table, s, p. d and f block elements, periodic trends in properties of elements atomic and ionic radii, ionization enthalpy, electron gain enthalpy, valence, oxidation states and chemical reactivity. General Principles and processes of isolation metals:Modes of occurrence of elements in nature,minerals,ores;Steps involved in the extraction of metals-concentration, reduction(chemical and electrolytic methods)and refining with special reference to the extraction of Al. Cu, Zn and Fe; Thermodynamic and electrochemical principles involved in the extraction of metals.

UNIT8:HYDROGEN AND S-BLOCK ELEMENTS:

Hydrogen: Position of hydrogen in periodic table, isotopes, preparation, properties and uses of hydrogen; physical and chemical properties of water and heavy water; structure, preparation,reactions and uses of hydrogen peroxide;classification of hydrides-ionic,covalent and interstitial; hydrogen as fuel.s-block elements(alkali and alkaline earth metals).

Group 1 and 2 Elements: General introduction, electronic configuration and general trends in physical and chemical properties of elements, anomalous properties of the first element of each group,diagonal relationships.

Preparation and properties of some important compounds-sodium carbonate and sodium hydroxide and sodium hydrogen carbonate; Industrial uses of lime, limestone. Plaster of Paris and cement:biological significance of Na, K.Mg and Ca.

UNIT9:P-,D-AND F-BLOCK ELEMENTS:

p-block elements: General introduction, Electronic configuration and general trends in physical and chemical properties of elements across the periods and down the groups; unique behavior of the first element in each group.

Groupwise Study of the p – block elements,

Group -13: Preparation, properties and uses of boron and aluminum; Structure, properties and uses of borax, boric acid, diborane,boron trifluoride,aluminum chloride and alums.

Group-14:The tendency for catenation;Structure, properties and uses of Allotropes and oxides of carbon, silicon tetrachloride,silicates,zeolites and silicones.

Group -15: Properties and uses of nitrogen and phosphorus; Allotropic forms of phosphorus;Preparation, properties, structure and uses of ammonia, nitric acid, phosphine and phosphorus halides,(PCl_3.PCl_5);Structures Of Oxides And Oxoacids Of Nitrogen And phosphorus.

Group -16: Preparation, properties, structures and uses of ozone: Allotropic forms of sulphur;Preparation, properties, structures and uses of sulphuric acid(including its industrial preparation);Structures of oxoacids of sulphur.

Group-17: Preparation, properties and uses of hydrochloric acid; Trends in the acidic nature of hydrogen halides;Structures of interhalogen compounds and oxides and oxyacids of halogens.

Group-18: Occurrence and uses of noble gases; Structures of fluorides and oxides of xenon.d-and f-block elements:

Transition Elements: General introduction,electronic configuration,occurrence and characteristics,general trends in properties of the first-row transition elements-physical properties, ionization enthalpy, oxidation states, atomic radii, colour, catalytic behavior, magnetic properties, complex formation, interstitial compounds, alloy formation; Preparation, properties and uses of $K_2Cr_2O_7$,and $KMnO_4$.

Inner Transition Elements:

Lanthanide: Electronic configuration, oxidation states and lanthanide contraction.

Actinides:Electronic Configuration and oxidation states.

Coordination compounds: Introduction to coordination compounds. Werner's theory; ligands,coordination number, denticity, chelation; IUPAC nomenclature of mononuclear coordination compounds, isomerism; bonding-valence bond approach and basic ideas of crystal field theory,color and magnetic properties; importance of coordination compounds (in qualitative analysis,extraction of metals and in biological systems).

UNIT10:ENVIRONMENTAL CHEMISTRY:

Environmental pollution: Atmospheric, water and soil. Atmospheric pollution: Tropospheric and Stratospheric

Troposphericpollutants:Gaseous Pollutants-Oxides Of Carbon,nitrogen and sulphur,

hydrocarbons;their sources,harmful effects and prevention; Greenhouse effect and Global warming: Acid Rain. Particulate pollutants:Smoke, dust, smog, fumes, mist;their sources, harmful effects and prevention Stratospheric Pollution:Formation and breakdown of Ozone,depletion of the ozone layer-its mechanism and effects WaterPollution:Major pollutants

such as pathogens,organic wastes and chemical pollutants;their harmful effects and prevention.
Soil pollution: Major pollutants such as; Pesticides (insecticides. herbicides and fungicides), their harmful effects and prevention. Strategies to control environmental pollution.

UNIT11: PRINCIPLES OF ORGANIC CHEMISTRY AND HYDROCARBONS:

Tetravalency of carbon: Shapes of simple molecules - hybridization (s and p): Classification of organic compounds based on functional groups: and those containing halogens, oxygen, nitrogen and sulphur; Homologous series: Isomerism - structural and stereoisomerism. Nomenclature (Trivial and IUPAC), Covalent bond fission-Homolytic and heterolytic:free radicals,carbocations and carbanions; stability carbocations and free radicals, electrophiles and nucleophiles. Electronic displacement in a covalent bond - Inductive effect, electromeric effect, resonance and hyperconjugation.

Common types of organic reactions - substitution, addition, elimination and rearrangement. Hydrocarbons:Classification, isomerism, IUPAC nomenclature, genera methods of preparation,properties and reactions.

Alkanes:Conformations:Sawhorse and Newman projections(of ethane):Mechanism Of Halogenation Of alkanes.

Alkenes: Geometrical isomerism: Mechanism of electrophilic addition: addition of hydrogen,halogens,water,hydrogen halides (Markownikoffs and peroxide effect):Ozonolysis and polymerization.

Alkynes:Acidic Character:Addition Of Hydrogen,halogens,water hydrogen halides:Polymerization.

Aromatic Hydrocarbons:Nomenclature, benzene-structure and aromaticity:Mechanism Of Electrophilic substitution:halogenation, nitration.

Friedel - Crafts alkylation and acylation, directive influence of the functional group in mono-substituted benzene.

UNIT12: ORGANIC COMPOUNDS CONTAINING OXYGEN, NITROGEN AND HALOGEN FUNCTIONAL GROUPS:

Organic Compounds Containing Oxygen: General methods of preparation, properties, reactions and uses. Alcohols: Identification of primary, secondary and tertiary alcohols: mechanism of dehydration. Phenols: Acidic nature, electrophilic substitution reactions: halogenation, nitration and sulphonation.Reimer-Tiemann Reaction. Ethers:Structure Aldehyde and Ketones:Nature Of carbonyl group; Nucleophilic addition to >C=O group, relative reactivities of aldehydes and ketones; Important reactions such as - Nucleophilic addition reactions (addition of HCN. NH_3,and its derivatives), Grignard reagent; oxidation: reduction (Wolf Kishner and Clemmensen); the acidity of hydrogen. aldol condensation, Cannizzaro reaction. Haloform reaction, Chemical tests to distinguish between aldehydes and ketones. Carboxylic Acids: Acidic strength and factors affecting it

Organic Compounds Containing Nitrogen: General methods of preparation. Properties, reactions and uses. Amines: Nomenclature, classification structure, basic character and identification of primary, secondary and tertiary amines and their basic character. Diazonium Salts: Importance in synthetic organic chemistry.

Organic Compounds Containing Halogen:General Methods Of Preparation, properties and reactions;Nature of C-Xbond; Mechanisms of Substitution reactions.Uses; Environmental Effects of chloroform, iodoform, freon and DDT.

UNIT13:POLYMERS AND BIOMOLECULES:

Polymers:General introduction and classification of polymers,general methods of polymerization - addition, condensation and copolymerization. Natural and synthetic rubber and vulcanization,some important polymers with emphasis on their monomers and uses,e.g., polythene, nylon, polyester and bakelite.

Biomolecules:General introduction and importance of biomolecules.

Carbohydrates: Classification; aldoses and ketoses: monosaccharide's (glucose and fructose) and Constituent monosaccharides in oligosaccharides(sucrose,lactose and maltose).

Proteins:Elementary Idea amino acids, peptide bond, polypeptides.Proteins:primary, secondary, tertiary and quaternary structure (qualitative idea only), denaturation of proteins,enzymes.

Vitamins:Classification And Functions.

Nucleic Acids:Chemical constitution DNA and RNA,Biological Function of Nucleic Acids.

UNIT14:CHEMISTRY IN EVERYDAYLIFE:

Chemicals in Medicines: Analgesics, tranquilisers, antiseptics, disinfectants, antimicrobials,anti-fertility drugs, antibiotics, antacids. Antihistamines -their meaning and common examples. Chemicals in food: Preservatives, artificial sweetening agents - common examples. Cleansing Agents:Soaps and detergents,cleansing action

UNIT15:THEORETICAL PRINCIPLES OF EXPERIMENTAL CHEMISTRY:

Purification methods: Crystallization, sublimation, distillation, differential extraction and chromatography–principles and their applications.

Qualitative Analysis:Detection Of nitrogen, sulfur,phosphorus and halogens.

Quantitative analysis: (basic principles only) Estimation of carbon, hydrogen, nitrogen, halogens, sulphur, phosphorus.

Calculations of empirical formula and molecular formulae: Numerical problems in organic quantitative analysis,

Detection of extra elements (nitrogen, sulphur and halogens) in organic compounds; Detection of the following functional groups; hydroxyl (alcoholicandphenolic), carbonyl (aldehydes and ketones)carboxyl and amino groups inorganic compounds.

The Chemistry involved in the preparation of the following:

Inorganic Compounds;Mohr's Salt,potash alum.

Organic Compounds: Acetanilide,p-nitroacetanilide, aniline yellow,iodoform.

The chemistry involved in the titrimetric exercises: acids, bases and the use of indicators, oxalic-acid vs $KMnO_4$, Mohr's Salt vs $KMnO_4$

Qualitative Analysis Of Inorganic Salts:Chemical principles involved in qualitative salt analysis: Cations - $Pb^{2+,}$ $Cu^{2+,}$ Al^{3+}, Fe^{3+}, Zn^{2+}, Ni^{2+}, Ca^{2+}, Ba^{2+}, Mg^{2+}, NH^{+} Anions- CO^{2-}**,** S^{2-},SO^{2-},NO^{3-}, NO^{2-},Cl^{-},Br^{-}, I^{-}(insoluble salts excluded).

9. ELIGIBILITY FOR APPEARING TO MGMU-CET-2025

All the candidates appeared / passed the qualifying examination ie.,HSC/12th Standard examination or its equivalent examination and having Indian Nationality are eligible to appear for MGMU-CET-2025.

Maharashtra State Candidate:

(i) The Candidate should be an Indian National and having domicile of Maharashtra State and/or born in Maharashtra state.

(ii) Appeared for HSC or its equivalent examination from Maharashtra State.

All India and NRI*Candidates:

(i) The Candidate should be an Indian National.

(ii) Appeared for HSC or its equivalent examination.

Examination Centre: The MGMU-CET-2025 will be conducted online through the ERP system, but students are required to be physically present on campus to appear for this online examination.

Important Instructions to the MGMU-CET-2025 appearing candidates

1 The Online question paper will contain Multiple Choice Questions (MCQs) with four options for each question out of which only one alternative/answer will be the correct.

2 Each question in the Physics and Chemistry sections will carry 1 mark, while questions in the Mathematics section will carry 2 marks.

3 There is no Negative Marking.

4 The questions will be displayed on the computer screen one at a time. Candidates are advised not to spend too much time on any particular question.

5 Questions will be available in English language only.

The examination will be 180 minutes long, with candidates required to solve 150 questions. The first 90 minutes are allocated to Physics and Chemistry, after which the section will auto-submit, and the Mathematics section will open for the remaining 90 minutes

Candidates found using any unfair means during examination will forfeit their chance of being considered for admission and will be debarred from examination and Admission Process of MGMU-CET 2025.

Sr.No.	Type of Group	Total Duration (in Min)	01 To 90 Min	91 To 180 Min
1	PCM Group	180	Physics & Chemistry	Mathematics

Candidates are advised to practice using the mock test link to familiarize themselves with the online examination interface. A mock link for the MGMU-CET-2025 online examination will be available on the official websites https://mgmu.ac.in and https://jnec.org

10. ONLINE APPLICATION FORM:-

The application form for MGMU-CET-2025 is available online only. The Information Booklet and User Manual for filling out the application form are available on

https://mgmu.ac.in and https://jnec.org. Candidates must refer to the User Manual before completing the application form

For all future correspondence with the MGMU-CET-2025 Admission Office, please quote your unique application number

The Online Application Submission is four step process:

- **Registration:** Create a username and password
- **My Application:** Fill out the Application Form for MGMU-CET 2025
- **Upload of Photograph and Signature:** Upload a recent photograph and signature in online system
- **Payment of Fees:** Complete the payment of fees using online payment mode only.

To Upload Photograph and Signature:

All the applicants are required to upload a recent scanned / digital color photograph and signature. The file size of the Photograph should be between 15 KB to 50 KB and Signature should be between 5KB to 20 KB. The online application system will not allow uploading files smaller or larger than the specified size. All Candidates have to upload their Photograph and Signature in ".jpg" format only and file name of Photograph and signature should preferably be photo.jpg and sign.jpg respectively.

MGMU-CET 2025 Application Fee Payment:

Application form processing fees for all categories is Rs. 1500/- only. This fee is non-refundable and non-transferable under any circumstances.

The payment must be made through online mode and additional service charges may apply as per the payment gateway rules.

Registration Process Completion:

On successful payment of the application fee, a confirmation of the same will be displayed online. Candidates shall print the receipt for future references. After successful payment, Candidate shall take the print out of its online application form for MGMU - CET 2025. Keep a copy of MGMU-CET 2025 Application Number, Login ID & Password**.**

Download Admit Card:

To download the Admit Card, candidates must visit https://mgmu.ac.in or www.jnec.ac.in and log in to their ERP account using their registered credentials.

The issuance of an Admit Card is solely an enabling document for appearing in the MGMU-CET 2025. It does not guarantee that the candidate fulfills all eligibility conditions for admission.

Important Note:

1. **Application form Submission:**

- Incomplete application forms will be rejected.
- Candidates are allowed to submit only one application form. If a candidate wishes to submit a new application, the previous application must first be canceled.
- The process for canceling an application is explained in the User Manual available for online application submission.

- If an application is canceled, the fee paid will not be refunded under any circumstances.

2. Contact Details:

The email ID and mobile number provided in the application form will be considered the primary contact details. All communication regarding MGMU-CET 2025 and further admission process will be sent to these details. Candidates must use their own personal contact details while filling out the application form and avoid using their parents' or any other person's contact details.

3. Communication:

If an email is not found in the inbox, candidates should check other folders including the Spam/Junk/Promotion folder. Candidates are advised to check their emails regularly for updates and communication.

11. DECLARATION OF RESULT

The Incharge of MGMU-CET-2025 will conduct the examination and declare the result. The result will be declared online in their respective ERP login.

The Competent Authority shall invite application for admission and after verification of documents and eligibility, prepare the Merit Lists as per the Rules.The downloadable MGMU-CET-2025 marksheet *will be made available online in their respective ERP login* as per schedule.

While declaring the result, if a candidate remains absent in any one subject in PCM the Total Marks for PCM will be declared as 'ABS' (Absent) as the case may be.

12. LEGAL JURISDICTION

All disputes pertaining to the conduct of examination and selection shall fall within the jurisdiction of Courts, at Chhatrapati Sambhajinagar only. The Incharge of MGMU - CET-2025 Admission Cell shall be the legal person authorized for legal matters.

13. CONDUCT AND DISCIPLINE

Failure of the candidate in entering full and correct information in the online application form and /or suppression of any information would lead to disqualification of the candidate for MGMU-CET-2025 or even at a later date. Such a candidate will be debarred from the examination /entire selection process.

Adopting an unfair means or engaging in malpractice in the examination shall render the candidate liable for punishment and disqualify the candidate for MGMU-CET- 2025 examination.

Any issue not dealt here-in above will be dealt with, when arising, fully and finally by the competent authority. Any amendments made by the Registrar, MGM University Chhatrapati Sambhajinagar from time to time will be implemented.

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