APPENDIX 1: SRMJEEE/SRMAPET

SRM University-*AP* Entrance Exam (SRMJEEE/SRMAPET) 2024

Mode of Examination	**Online Computer based proctored examination**
Duration	**2 Hours 30 Minutes**
Question Type	**Objective Type Multiple Choice Questions**
Marking Scheme	**Correct Answer - 1 Marks Incorrect Negative Answer - 0 (No negative marking)** **Not Answered - 0 Mark**

SRMJEEE 2024 marking scheme and marks weightage:

Subject	No. of Questions	Marks Per Questions
Physics	35	1
Chemistry	35	1
Mathematics/Biology	40	1
Aptitude	10	1
English	5	1

Note: Applicants can register for SRMJEEE/SRMAPET 2024 by filling out and submiting the application form online.

Entrance Exam Rules

1. Entrance Examination Rules

a) Candidates will be taking a computer-based online test.

2. Hall Ticket

a) The hall ticket will be issued only to those eligible candidates who have submitted their application form, complete in all respects, on or before the last date as specified.
b) The hall ticket will contain the name, photograph, and address of the candidate.
c) The hall ticket should be downloaded from the candidate's login /dashboard.
d) Once received, it should be carefully examined by the candidate. If any discrepancy is noticed, it should immediately be brought to the notice of the Directorate of Admissions.
e) The hall ticket is not transferable to any other person. Impersonation is a legally punishable offense.
f) If the Hall Ticket is not received by the candidate due to an incomplete application, the university is not responsible for informing students about their incomplete applications. Candidates are advised to double-check that the application form is complete in all respects before posting it.

3. Results

a) A merit list will be prepared based on the total marks secured in the SRMJEEE (UG)/SRMAPET.
b) Students in the merit list would be intimated of the rank.

Login credentials for applicant dashboard: As sent to your e-mail address.

Use login id and password to:

- View your application details.
- Boo exam slot, download and print your hall ticket.
- View you results and counselling details. Download and take a printout of rank card, counselling call letter and related information fo r yo ur use.
- Refer to SRM's official website to know about the courses offered and eligibility for BTech Programmes.

Application Fee

₹ 1200 (Non-Refundable)

How To Apply

a) Applicants can access the online application portal via https://srmap.edu.in/indian-admission/

b) For specific details, applicants are advised to read the admission application form carefully.

4. SYLLABUS FOR ENTRANCE EXAMINATION SRMJEEE (UG) BTECH

PHYSICS (35 Questions)

Unit 1: Units and Measurement, **Mechanics** Units for measurement, system of units-S.I., fundamental and derived units, measurements - errors in measurement - significant figures, dimensions - dimensional analysis - applications.
Laws of Motion: Newton's laws of motion - projectile motion-uniform circular motion - friction - laws of friction - applications - centripetal force.
Work, Energy and Power: Work - energy- potential energy and kinetic energy – power - collision-elastic and inelastic collisions.

Unit 2: Gravitation, Mechanics of Solids and Fluids
Gravitation: The universal law of gravitation, acceleration due to gravity - variation of 'g' with altitude, latitude and depth - gravitation potential - escape velocity and orbital velocity - geostationary satellites.
Mechanics of solids and fluids: Hooke's law - Modulli of elasticity - surface tension capillarity - applications – viscosity - Poiseuille's formula - Stokes law applications - streamline and turbulent flow - Reynolds number - Bernoulli's theorem - applications.

Unit 3: Electrostatics
Electric charge - Conservation laws - Coulomb's law-principle of superposition - continuous charge distribution - electric field - electric field lines - electric dipole -electric field due to a dipole - torque on a dipole in uniform electric field - Electric flux - Gauss's theorem - field due to infinitely long straight wire - uniformly charged infinite plane sheet. Electric potential - potential difference - equipotential surfaces - electrical potential energy - Dielectrics and electric polarization - capacitors and capacitance - combination of capacitors in series and in parallel - capacitance of a parallel plate capacitor with and without dielectric medium - energy stored in a capacitor.

Unit 4: Current Electricity
Electric current - drift velocity - mobility - Ohm's law -V-I characteristics - electrical energy and power - electrical resistivity and conductivity - temperature dependence - Internal resistance of a cell - potential difference and emf of a cell - combination of cells in series and in parallel - Kirchhoff's laws – applications – Wheatstone bridge-Potentiometer-comparison of EMF of two cells - measurement of internal resistance of a cell.

Unit 5: Magnetism and Magnetic effects of current
Earth's magnetic field and magnetic element - tangent law, tangent galvanometer deflection magnetometer - Magnetic effects of electric current – Biot Savart's law - moving coil galvanometer - conversion of a galvanometer into voltmeter and ammeter.

Unit 6: Electromagnetic Induction, Alternating Currents and Electromagnetic Waves
Electromagnetic induction - Faraday's laws, induced EMF and current - Lenz's Law - Eddy currents - Self and mutual induction - Alternating currents, peak and RMS value of alternating current/voltage - reactance and impedance - LC oscillations - LCR series circuit - resonance - AC generator and transformer - Electromagnetic waves – characteristics - Electromagnetic spectrum.

Unit 7: Optics
Reflection of light - refraction of light -total internal reflection- optical fibers - refraction at spherical surfaces – lenses - thin lens formula - lensmaker's formula - magnification - power of a lens - combination of thin lenses in contact - refraction of light through a prism Wave front and Huygen's principle - reflection and refraction of plane wave at a plane surface- laws of reflection and refraction using Huygen's principle – Interference - Young's double slit experiment and expression for fringe width - diffraction due to a single slit -width of central maximum.

Unit 8: Dual Nature of Radiation and Matter & Atomic Physics
Dual nature of radiation - Photoelectric effect - Hertz and Lenard's observations - Einstein's photoelectric equation-particle nature of light. Matter waves-wave nature of particles - de- Broglie relation- Alpha-particle scattering experiment - Rutherford's model of atom - Bohr model - hydrogen spectrum.

Unit 9: Nuclear Physics
Nuclear radius, mass, binding energy, density, isotopes, mass defect- Bainbridge mass spectrometer-nuclear forces neutron discovery- artificial radio activity-radio isotopes-radio carbon dating-radiation hazards. Nuclear fission- nuclear reactor-nuclear fusion-hydrogen bomb - cosmic rays-elementary particles.

Unit 10: Electronic Devices
Semiconductors-doping-types-PN junction diode – biasing-diode as a Rectifier – Special purpose PN junction diodes – LED – photodiode - solar cell- transistors-transistor characteristics -logic gates- basic logic gates-NOT, OR, AND, NOR, NAND- universal gates-De Morgan’s theorem.

CHEMISTRY (35 Questions)

Unit 1: Solutions
Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties - relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties.

Unit 2: Electrochemistry
Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell.

Unit 3: Chemical Kinetics
Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions).

Unit 4: Surface Chemistry
Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, colloidal state distinction between true solutions, colloids and suspension;

lyophilic, lyophobic multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.

Unit 5: p - Block Elements

Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: Preparation, Properties and uses, classification of Oxides, Ozone, Sulphur - allotropic forms; compounds of Sulphur: Preparation Properties and uses of Sulphur- dioxide, Sulphuric Acid: industrial process of manufacture, properties and uses; Oxoacids of Sulphur (Structures only). Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and uses of Hydrochloric acid, interhalogen compounds (structures only). Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Unit 6: 'd' and 'f' Block Elements

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.

Unit 7: Coordination Compounds

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT.

Unit 8: Haloalkanes and Haloarenes Haloalkanes

Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation. Haloarenes: Nature of C-X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only).

Unit 9: Alcohols, Phenols and Ethers

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration.
Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols.
Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.

Unit 10: Aldehydes, Ketones and Carboxylic Acids

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses.
Carbolic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit 11: Organic compounds containing Nitrogen

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

Unit 12: Biomolecules

Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration
Proteins -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins

Nucleic Acids: DNA and RNA.

MATHEMATICS (40 Questions)

Unit 1: Sets, Relations and Functions
Sets and their representations, union, intersection and their algebraic properties, relations, equivalence relations, mappings, one- one, into and onto mappings, composition of mappings.

Unit 2: Complex Numbers and Quadratic Equations
Complex numbers in the form a+ib and their representation in a plane. Quadratic equation in real and complex number system and their solutions. Relation between roots and coeficients, nature of roots, formation of quadratic equations with given roots; symmetric functions of roots, equations reducible to quadratic equations.

Unit 3: Matrices, Determinants and their applications
Determinants and matrices of order two and three, minors, cofactors and applications of determinants in finding the area of a triangle, equality, types zero and identity matrix, transpose, symmetric and skew symmetric. Evaluation of determinants. Addition and multiplication of matrices, simple properties,
adjoint and inverse of matrix, solution of simultaneous linear equations using determinants and matrices using inverses.

Unit 4: Combinatorics
Permutations and Combinations: Fundamental principle of counting: permutation as an arrangement without repetitions and constraint repetitions, no circular permutations. Combination as selection, problems in P(n,r) and C(n,r), factorial, simple applications.

Unit 5: Algebra
Sequences and Series: Arithmetic, geometric and harmonic progressions. Insertion of arithmetic, geometric and harmonic means between two given numbers. Relation between A.M., G.M. and
H.M. arithmetic, geometric series, exponential and logarithmic series.

Unit 6: Differential Calculus and its applications
Polynomials, rational, trigonometric, logarithmic and exponential functions. Inverse functions. Graphs of simple functions. Limits, continuity, differentiation of the sum, difference, product and quotient of two functions, differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite and implicit functions, upto second order derivatives.
Applications of Differential Calculus: Rate of change of quantities, monotonic–increasing and decreasing functions, maxima and minima of functions of one variable, tangents and normal, Rolle's and Lagrange's mean value theorems. Ordinary differential equations, order and degree. Formation of differential equations, solution of differential equations by the method of separation of variables. Solution of homogeneous and linear differential equations and those of the type $dy/dx + p(x)y=q(x)$.

Unit 7: Integral Calculus and its applications
Fundamental integrals involving algebraic, trigonometric, exponential and logarithmic functions. Integration by substitution, integration using trigonometric identities, properties of definite integrals. Evaluation of definite integrals excluding application of definite integrals.

Unit 8: Analytical Geometry

Straight Lines in Two Dimensions: Straight line - Normal form – Illustrations. Straight line - Symmetric form. Straight line - Reduction into various forms. Intersection of two Straight Lines. slope of a line, parallel and perpendicular lines, intercepts of a line on the coordinate axes. Family of straight lines - Concurrent lines. Condition for Concurrent lines.

Cartesian system of rectangular co-ordinates in plane, distance formula, area of a triangle and condition for the collinearity of three points and section formula, Concurrent lines - properties related to a triangle. centroid and incentre of a triangle, locus and its equation.

Circles in Two Dimensions: Standard form of equation of a circle, general form of the equation of a circle, its radius and centre, equation of a circle in the parametric form, equation of a circle when the endpoints of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to the circle.

Conic Sections in Two Dimensions: Sections of cones, equations of conic sections (parabola, ellipse and hyperbola) in standard form. Problems using their geometrical properties.

Unit 9: Vector Algebra

Vectors and scalars, addition of vectors, components of a vector in two dimensions and three-dimensional space, scalar and vector products, scalar and vector triple product. Application of vectors to plane geometry.

Unit 10: Statistics and Probability distribution Measures of Central Tendency and Dispersion: Calculation of mean, median and mode of 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 and their applications; Conditional probability; Baye's theorem, probability distribution of a random variable; Binomial, Poisson and Normal distributions and their properties.

Unit 11: Trigonometry

Trigonometry ratios, compound angles, solution of triangles, Trigonometric identities and equations-Inverse trigonometric functions definition range and domain Properties of triangles, including, incentre, circumcenter and orthocenter, solution of triangles Problems related to Heights and distances.

English (5 Questions)

Questions in this part contain Comprehension type questions in the form of short passages or lines of poems or a dialogue. The candidate should read the given text and answer the set of Questions. Each question has 4 choices, out of which choose the best answer.

APTITUDE (10 Questions)

1. Number System

Properties of numbers, Divisibility rules, Unit digit, Euclid's algorithm, LCM and GCD

2. Statistics

Arithmetic mean, weighted mean, Geometric mean

3. Percentage
Percentage change-increase or decrease

4. Profit and Loss
Computing percentage of profit or loss and profit/loss value

5. Quadratic Equation
Nature of roots, Relationship between roots and coeficients, Solutions of quadratic equation

6. Geometry
Similar triangles, Lines and angles, Circles and Quadrilaterals

7. Arrangement
Ordering, Grading and Ranking, coding and decoding

8. Direction Sense test
Finding direction, distance or both

9. Linear Equation
Solving simultaneous equations, Test of consistency, problems on ages

10. Trigonometry
Values of trigonometric ratios, Identities, Heights and distances