Gujarat Technological University

New Syllabus

# DDCET

# DIPLOMA TO DEGREE COMMON ENTRANCE TEST

(For All Diploma Engineering Students)

**ENGLISH MEDIUM**

## Section - 01

## Basics of Science and Engineering

## Section - 02

## Aptitude Test (Mathematics & Soft Skill)

**Theory + More than 1500 MCQs with Answers**

: Authors :

A Group of Experts

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# GUJARAT TECHNOLOGICAL UNIVERSITY

## Diploma to Degree Common Entrance Test

## Revised DDCET (Engineering) Exam Syllabus-2024-25

| Program Number | Paper | Paper | No. of Question | Maximum Marks | Time Duration |
|---|---|---|---|---|---|
| Engineering (All Branches) | Basics of Science and Engineering | BE 01 | 50 | 100 | 150 min. (Two & Half Hours) |
| | Aptitude Test Mathematics and Soft Skill) | BE 02 | 50 | 100 | |
| | | Total | 100 | 200 | |

## Section 01 - BE - 01 Basics of Science and Engineering

| Sr. No. | Topic | Sub-Topic | Weightage (%) |
|---|---|---|---|
| 1. | Units and Measurement | • Physical quantities and units.<br>• Interconversion of units MKS (SI) to CGS and vice versa.<br>• Errors, Estimation of error, relative error, percentage error, propagation of errors.<br>• Measurement with Vernier caliper and micrometer screw gauge. | 12 |
| 2. | Classical Mechanics | • Linear motion, velocity, acceleration, force, Newton's laws of motion, linear momentum and impulse of force.<br>• Circular motion, angular velocity, angular acceleration, centripetal and centrifugal force.<br>• Work, energy, kinetic energy, potential energy, power. | 12 |
| 3. | Electric Current | • Ohm's Law and application<br>• Charge, interaction of charges, Coulomb's force.<br>• Electric field, electric potential, electric flux, electric current.<br>• Resistance, conductance, resistivity, conductivity, series and parallel combination of resistors.<br>• Capacitance, parallel plate capacitor, series and parallel combination of capacitors. | 12 |
| 4. | Heat and Thermometry | • Modes of heat transfer<br>• Various temperature scale, conversion of temperature, Kelvin – Celsius, Kelvin – Fahrenheit, Fahrenheit – Celsius and vice versa.<br>• Heat capacity and specific heat.<br>• Thermal conductivity, coefficient of thermal conductivity, linear thermal expansion. | 12 |

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|---|---|---|---|
| 5. | **Wave motion, optics and acoustics** | • Types of waves, (progressive, stationary, mechanical, non-mechanical, transverse, longitudinal).<br>• Frequency, wavelength, periodic time and their relations.<br>• Properties and applications of electromagnetic waves (ordinary light, LASER) and sound waves (ultrasonic wave, audible wave).<br>• Amplitude, intensity, phase and wave equations.<br>• Reflection, refraction, Snell's law, absolute refractive index, relative refractive index, total internal reflection, critical angle, optical fiber (construction, properties and applications).<br>• Reverberation, Reverberation time, Sabine's formula, echo, absorption coefficient. | 12 |
| 6. | **Chemical Reactions and Equation** | • Chemical Equations : Writing a Chemical Equation, Balanced Chemical Equations.<br>• Types of Chemical Reactions : Combination Reaction, Decomposition Reaction, Displacement Reaction, Double Displacement Reaction. | 6 |
| 7. | **Acids, Bases and Salts** | • Understanding the Chemical Properties of Acids and Bases.<br>• Reaction of Metallic Oxides with Acids.<br>• Reactions of an Acid or a Base in Water Solutions.<br>• Importance of pH in Everyday life.<br>• Salts : Family of salts, pH of salts. | 8 |
| 8. | **Metals and Non-metals** | • Physical properties of Metals and Non-metals.<br>• Chemical Properties of Metals.<br>• How do Metals and Non-metals React ? : Properties of Ionic compounds.<br>• Corrosion of Metals | 6 |
| 9. | **Computer Practice** | • Basics of Computer System<br>• Introduction to Internet HTML<br>• Using MS - Word /MS-Excel/MS-Power Point | 10 |
| 10. | **Environmental Sciences** | • Ecosystem<br>• Pollution and its types<br>• Climate Change<br>• Renewable Sources of Energy such as Hydro, Solar, Wind, Bio-mass, Tidal and Geothermal - their availability and limitations. | 10 |

- **References :**


1. Std. 10 Science State/NCRT Textbook
2. All India Council for Technical Education (AICTE), Model Curriculum for the Diploma Courses in Engineering & Technology-2019.
3. Diploma Syllabus of all Concerned State /Private Universities.

## Section 02 - BE - 02 Aptitude Test (Mathematics & Soft Skill)

| Sr. No. | Topic | Sub-Topic | Weightage (%) |
|---|---|---|---|
| 1. | **Determinant and Matrices** | • Determinant and its value up to 3rd order (Without properties)<br>• Concept of a Matrix<br>• Types of Matrices (Rectangular matrix, Square matrix, Null matrix, Diagonal matrix, Scalar matrix, Identity matrix, Singular and Non-singular matrix)<br>• Addition, Subtraction and multiplication by scalar of matrices<br>• Product of two matrices<br>• Adjoint and Inverse of a matrix of order 2X2.<br>• Solution of Simultaneous linear equations of two variables | 8 |
| 2. | **Trigonometry** | • Units of Angles (degree and radian)<br>• Trigonometric Functions<br>• Periods of Trigonometric functions<br>• Allied & Compound Angles, Multiple –Submultiple angles<br>• Sum and factor formula | 6 |
| 3. | **Vectors** | • Introduction of a Vector<br>• Direction and Magnitude<br>• Types of vectors (Null vector, Unit Vector)<br>• Addition, Subtraction.<br>• Scalar product (Dot product) and<br>• Vector Product (Cross product)<br>• Angle between two Vectors | 4 |
| 4. | **Co-ordinate Geometry** | • Introduction and slope of a line<br>• Equation of a line (Two-point form, Slope point form, Intercept form, General form)<br>• Condition of parallel and perpendicular lines<br>• Equation of Parallel and Perpendicular lines to the given line<br>• Angle between two lines<br>• Equation of a circle with centre and radius<br>• To find centre and radius from general equation of a circle | 4 |
| 5. | **Function & Limit** | • Function and simple examples<br>• Limit of a Function<br>• Standard formulae of Limit and related simple examples | 6 |
| 6. | **Differentiation and its Applications** | • Concept of Differentiation<br>• Working rule : Sum, Subtraction, Product and Quotient<br>• Chain Rule<br>• Derivative of Implicit functions, Parametric functions<br>• Logarithmic Differentiation<br>• Successive Differentiation up to second order<br>• Applications : Velocity, Acceleration of given simple functions | 8 |

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|---|---|---|---|
| 7. | **Integration** | • Concept of Integration<br>• Working rules and Integral of standard functions<br>• Method of substitution & Integration by parts (simple examples)<br>• Definite Integral (simple examples) | 8 |
| 8. | **Logarithm** | • Logarithm as a function<br>• Laws of Logarithm and related Simple examples | 4 |
| 9. | **Statistics** | • Mean, Median and Mode for ungrouped data | 2 |
| 10. | **Comprehension of Unseen Passage** | • An unseen passage will be given followed by 5 questions. Students have to read the passage and answer the questions. | 10 |
| 11. | **Theory of Communication** | • Process of Communication<br>• Verbal and Non-verbal Communication<br>• Barriers to Communication | 10 |
| 12. | **Techniques of Writing** | • Parts of Letter and Email<br>• Types of Business Letter (Inquiry, Reply, Order, Complaint, Adjustment)<br>• Common Abbreviations used in Business Letter | 10 |
| 13. | **Grammar** | • Parts of Speech<br>(1) Noun (2) Pronoun (3) Adjective (4) Adverb<br>(5) Verb (6) Preposition (7) Connectors (7) Interjection<br>• Tenses<br>• Subject Verb Agreement | 10 |
| 14. | **Correction of Incorrect Words and Sentences** | • Word Correction : Students have to choose correct spelling of the word from the options given<br>• Sentence Correction : Students have to choose grammatically or structurally correct sentence from the options given. | 10 |

- **References :**


1. All India Council for Technical Education (AICTE), Model Curriculum for the Diploma Courses in Engineering & Technology-2019.
2. Diploma Syllabus of all Concerned State /Private Universities.