



VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

Affiliated to JNTUH, Approved by AICTE, Accredited by NAAC with A++ Grade, ISO 9001:2015 Certified
Kacharam, Shamshabad, Hyderabad - 501218, Telangana, India

OFFICE OF THE PRINCIPAL

F No.: VCE/ PrincipalOffice/Notification/2024-2025/042

04-11-2024

Vardhaman Scholarship Test - 2024 (VST-2024)

NOTIFICATION

Dear Students,

We are delighted to announce that the **Vardhaman Scholarship Test - 2024 (VST-2024)** is scheduled for **Saturday, 30-11-2024**. All the first year B.Tech. students are highly encouraged to participate in this valuable opportunity to demonstrate your academic proficiency. The test will assess your understanding of core concepts from selected courses.

The top three performers will be recognized and awarded scholarships as follows:

Position	Total Cash Prize	Amount Breakup
1 st Top performer	Rs. 1,40,000	Rs. 35,000 per year
2 nd Top performer	Rs. 1,20,000	Rs. 30,000 per year
3 rd Top performer	Rs. 1,00,000	Rs. 25,000 per year

Please find the key details below:

- **Courses Identified & Syllabi:** Enclosed
- **Eligibility:** First year B.Tech. students admitted in the Academic Year 2024-2025
- **Mode of Test:** Online
- **Question Paper Format:** Objective type
- **Negative Marking:** None
- **Test Date & Time:** 30-11-2024, from 10:00 AM to 12:30 PM
- **Test Duration:** 150 Min
- **Venue:** Block-1, VCE Campus
- **Registration Period:** From 04-11-2024 until 11:59 PM, 25-11-2024
- **Registration Fee:** Nil
- **Registration Link:** https://studentscorner.vardhaman.org/vst_registration.php

We encourage all eligible students to take full advantage of this opportunity. Best of luck to all participants!

Copy to:

All HODs, Deans, Exam Cell, TAP, Library

Circulation to:

All First Year Students, All Faculty



Ravindra

Prof. JVR Ravindra
PRINCIPAL

PRINCIPAL
VARDHAMAN COLLEGE OF ENGINEERING
Shamshabad, Hyderabad.



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COURSES IDENTIFIED FOR VST-2024

SNo	Name of the Course	Max Marks / Course	Cut Off Marks / Course	Total Marks	Duration of the Test
1.	Mathematics	30	15	150	150 Min.
2.	Physics	30	15		
3.	Chemistry	30	15		
4.	English	30	15		
5.	Aptitude	30	15		

SYLLABI FOR VST-2024

1. MATHEMATICS

LINEAR ALGEBRA: Types of matrices, matrix multiplication, Consistency and inconsistency of system of equations- Rank of a matrix, Angle between two non-zero vectors, Scalar product, Properties of dot product, Angle between two planes, Product of two vectors and properties.

TRIGONOMETRY: Trigonometric ratios and compound angles, Trigonometric ratios of multiple and sub-multiple angles, Transformations, Sum and Product rules, Inverse trigonometric functions and properties, Hyperbolic functions, General solution of trigonometric equations.

DIFFERENTIATION: Derivative of a function, Elementary Properties, derivatives of Trigonometric, Inverse trigonometric, Hyperbolic, Inverse Hyperbolic Functions, Methods of Differentiation, Second Order Derivatives, Lengths of tangent, normal, sub tangent and sub normal, Angles between two curves and condition for orthogonality of curves, Derivative as Rate of change, Rolle's theorem and Lagrange's mean value theorem.

INTEGRATION: Integration as the inverse process of differentiation, Standard forms, Properties of integrals, Method of substitution, integration of Algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions, Integration by parts, Integration by Partial fractions method, Reduction formulae, Definite Integral as the limit of sum, Interpretation of Definite Integral as an area, Fundamental theorem of Integral Calculus, Properties, Application of Definite integral to areas.

DIFFERENTIAL EQUATIONS: Formation of differential equation, Degree and order of an ordinary differential equation, Solving differential equation by

- Variables separable method,
- Homogeneous differential equation,
- Non - Homogeneous differential equation and Linear differential equations.

2. PHYSICS

ELECTROMAGNETIC INDUCTION: The Experiments of Faraday and Henry, Magnetic Flux, Faraday's Law of Induction, Lenz's Law and Conservation of Energy, Motional Electromotive Force, Energy Consideration, Eddy Currents, Inductance, AC Generator.

ELECTROMAGNETIC WAVES: Displacement Current, Electromagnetic Waves, Electromagnetic Spectrum.

ALTERNATING CURRENT: AC Voltage Applied to a Resistor, Representation of AC Current and Voltage by Rotating Vectors — Phasors, AC Voltage Applied to an Inductor, AC Voltage Applied to a Capacitor, AC Voltage Applied to a Series LCR Circuit, Power in AC Circuit: The Power Factor, LC Oscillations, Transformers.

COMMUNICATION SYSTEMS: Elements of a Communication System, Basic Terminology Used in Electronic Communication Systems, Bandwidth of Signals, Propagation of Electromagnetic Waves, Modulation and its Necessity.

SEMICONDUCTOR ELECTRONICS: Classification of Metals, Conductors and Semiconductors, Intrinsic Semiconductor, Extrinsic Semiconductor, p-n Junction, Semiconductor diode, Application of Junction Diode as a Rectifier, Special Purpose p-n Junction Diodes.

3. CHEMISTRY

CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES: Modern 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.

BIOMOLECULES: General introduction and importance of biomolecules; Carbohydrates: Classification: aldoses and ketoses; monosaccharides (glucose and fructose), constituent monosaccharides or oligosaccharides (sucrose, lactose, maltose) and polysaccharides (starch, cellulose, glycogen); Proteins: Elementary Idea of amino acids, peptide bond, polypeptides; Proteins: primary, secondary, tertiary and quaternary structure (qualitative idea only), denaturation of proteins, enzymes; Vitamins: Classification and functions; B Chemical constitution of DNA and RNA. Biological functions of nucleic acids.

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, colour and magnetic properties; Importance of coordination compounds (in qualitative analysis, extraction of metals and in biological systems).

ATOMIC STRUCTURE: Discovery of subatomic particles (electron, proton, and neutron); Thomson and Rutherford atomic models and their limitations; Nature of electromagnetic radiation, photoelectric effect; The spectrum of the hydrogen atom, Bohr model of 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 relationship, Heisenberg uncertainty principle; Shapes of s, p and d – orbitals, electron spin and spin quantum number; Rules for filling electrons in orbitals – Aufbau principle, Pauli Exclusion Principle and Hund's rule, electronic configuration of elements, the extra stability of half-filled and completely filled orbitals.

4. ENGLISH

GRAMMAR: Tenses, Articles, Prepositions, Conjunctions and Subject verb agreement.

VOCABULARY: Synonyms, Antonyms, Idioms, Phrasal verbs and One-word substitutions.

5. APTITUDE

NUMBERS: Operation on numbers, HCF and LCM of numbers, Decimal fractions.

RATIO AND PROPORTION: Ratio, Proportion, Variations, Problems on Ages.

AVERAGES, MIXTURES AND ALLEGATIONS: Averages, Weighted average, Difference between mixture and alligation, Problems on Mixtures and alligation

PERCENTAGES, SIMPLE INTEREST (SI) AND COMPOUND INTEREST (CI): Fundamentals of Percentage, Percentage change, SI and CI, Relation between SI and CI.

PROFIT AND LOSS, PARTNERSHIPS: Basic terminology in profit and loss, Types of partnership, Problems related to partnership

PERMUTATIONS AND COMBINATIONS: Fundamental counting principle, Definition of Permutation, Seating arrangement, Problems related to alphabets, Rank of the word, Problems related to numbers, Circular permutation, Combination

CLOCKS: Introduction, Finding angle between hands of clock, Gain or loss of time.

CALENDAR: Calendars method- 1, Calendars method -2

TIME, SPEED, DISTANCE AND WORK: problems on trains, boats and streams, pipes and cisterns