



ANNEXURE-I COMPUTER SCIENCE AND ENGINEERING

1. **Digital Electronics:** Number systems-Logic Gates, Boolean Algebra and basic Combinational circuits-Flip-Flops-Counters and registers-Additional Combinational Circuits.
2. **Software Engineering:** Basics of Software Engineering Designs & Life Cycle Models-Software Project Management-Requirement Analysis & Specifications-Software Design, Coding-Software testing, Debugging, Reliability, Quality Management & Maintenance.
3. **Computer Organisation and Microprocessors:** CPU Organization-Information representation and Arithmetic Operations-Memory Organization-I/O Organization-Fundamentals of 8086 and Advanced Processors.
4. **Data structures through C:** Introduction to Data structures, Searching and Sorting-Linked Storage Representation-Linked Lists-Linear Data Structures-Stacks-Linear Data Structures-Queues-Non-Linear Data Structures-Trees.
5. **Computer Networks:** Introduction to Networks-LAN components, Devices, tools, and Network Topologies-Network Addressing and sub-netting-Networks protocols and management-Basic Network administration.
6. **Operating Systems:** Introduction to Operating system-Process management-Synchronization & Deadlocks-Memory management-Disk scheduling and File management
7. **DBMS:** Concepts of DBMS & RDBMS-Concepts of SQL-Basics of PL/ SQL-Advanced PL/SQL-Concepts of NoSQL & MongoDB.
8. **Object oriented Programming through C++:** Object oriented programming concepts & Introduction to C++-Functions, Arrays, Pointers & References-Constructors, Destructors & Operator Overloading-Inheritance & Virtual functions-C++ I/O & Templates.
9. **Java Programming:** Basics of java and overloading-Concepts of inheritance, overriding, Interfaces and Packages-I/O Streams and Collections-Exception handling and Multithreaded Programming-Applets, AWT and Event Handling.



10. **Web Technologies:** Principles of Web Designing and HTML Introduction- Understand various HTML tags and usage of style sheets-Understand XML and Client side scripting using Java Script-JavaScript Ajax and J Query-Web servers and Server side scripting using PHP.



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ANNEXURE-II

Number of questions to be set unit wise (Total 100)

COMPUTERSCIENCEANDENGINEERING

UnitNo	Topic	Weightage_Marks
1	Digital Electronics	08
2	Software Engineering	08
3	Computer Organization and Microprocessors	12
4	Data Structures through C	10
5	Computer Networks	12
6	Operating Systems	12
7	DBMS	10
8	Object Oriented Programming through C++	10
9	Java Programming	10
10	Web Technologies	08



ANNEXURE - III

MODEL QUESTIONS FOR COMPUTER SCIENCE AND ENGINEERING

1. In a circular linked list, the insertion of a record involves modification of
 1. 3 pointers
 2. 4 pointers
 3. 2 pointers
 4. No pointers

2. Which of the following layer of OSI reference model deals with end to end communication?
 1. Presentation layer
 2. Session layer
 3. Network layer
 4. Transport layer



ANNEXURE - I

ENGINEERING MATHEMATICS

(Common for all branches of Diploma in Engineering)

Unit-I:

Matrices: Matrices of 3rd order: Types of matrices-Algebra of matrices-Transpose of a matrix-Symmetric, skew symmetric matrices-Minor, cofactor of an element-Determinant of a square matrix-Properties-Laplace's expansion-singular and non singular matrices-Adjoint and multiplicative inverse of a square matrix-System of linear equations in 3 variables-Solutions by Crammer's rule, Matrix inversion method .

Partial Fractions: Resolving a given rational function into partial fractions.

Unit –II:

Trigonometry: Properties of Trigonometric functions – Ratios of Compound angles, multiple angles, sub multiple angles – Transformations of Products into sum or difference and vice versa – Simple trigonometric equations – Properties of triangles – Inverse Trigonometric functions.

Complex Numbers: Modulus and conjugate, arithmetic operations on complex number—Modulus-Amplitude form (Polar form)-Euler form (exponential form)-Properties- De Moivre's Theorem and its applications.

Unit – III : Analytical Geometry

Circles-Equation given center and radius-given ends of diameter-General equation-finding center and radius. Standard forms of equations of Parabola, Ellipse and Hyperbola – simple properties.

Unit – IV : Differentiation and its Applications

Functions and limits – Standard limits – Differentiation from the First Principles – Differentiation of sum, product, quotient of functions, function of function, trigonometric, inverse trigonometric, exponential, logarithmic, Hyperbolic functions, implicit, explicit and parametric functions – Derivative of a function with respect to another function-Second order derivatives –Geometrical applications of the derivative (angle between curves, tangent and normal) – Increasing and decreasing functions – Maxima and Minima (single variable functions) using second order derivative only – Derivative as rate measure -Errors and approximations - Partial Differentiation – Partial derivatives up to second order – Euler's theorem.

Unit – V : Integration and Its Applications

Indefinite Integral – Standard forms – Integration by decomposition of the integrand of trigonometric, algebraic, exponential, logarithmic and Hyperbolic functions – Integration by substitution – Integration of reducible and irreducible quadratic factors – Integration by parts – Definite Integrals and properties, Definite Integral as the limit of a sum – Application of Integration to find areas under plane curves and volumes of Solids of revolution – Mean and RMS value.



Unit – VI: Differential Equations

Definition of a differential equation-order and degree of a differential equation- formation of differential equations-solution of differential equation of the type first order, first degree, variable-separable, homogeneous equations, exact, linear differential equation of the form $dy/dx + Py = Q$, Bernoulli's equation, nth order linear differential equation with constant

coefficients both homogeneous and non homogeneous and finding the Particular Integrals for the functions e^{ax} , x^m , $\sin ax$, $\cos ax$.



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ANNEXURE - II
FOR DIPLOMA HOLDERS
MATHEMATICS (Common Syllabus)

Number of Questions to be Set Unit Wise (Total 50)

UNIT NO	TOPICS	MARKS
I	Matrices	05
	Partial Fractions	02
II	Trigonometry	10
	Complex numbers	02
III	Analytical geometry	06
IV	Differentiation and its applications	10
V	Integration and its applications	08
VI	Differential equations	07
TOTAL		50



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ANNEXURE - III
FOR DIPLOMA HOLDERS
MODEL QUESTIONS FOR MATHEMATICS

1. The maximum value of $5+8\cos\theta+6\sin\theta$ is
 - 1) 25
 - 2) 19
 - 3) 15
 - 4) 5
2. The value of $\cos 10^\circ \cos 50^\circ \cos 70^\circ$ is
 - 1) $\frac{\sqrt{3}}{4}$
 - 2) $\frac{\sqrt{3}}{2}$
 - 3) $\frac{\sqrt{3}}{6}$
 - 4) $\frac{\sqrt{3}}{8}$
3. If $\sec 2\theta = \frac{-2}{\sqrt{3}}$ then the general solution θ is
 - 1) $2n\pi \pm \frac{5\pi}{6}$
 - 2) $n\pi \pm \frac{5\pi}{6}$
 - 3) $n\pi \pm \frac{5\pi}{12}$
 - 4) $2n\pi \pm \frac{\pi}{6}$
4. The eccentricity of the ellipse $3x^2+2y^2=6$ is
 - 1) $\frac{1}{3}$
 - 2) $\frac{1}{\sqrt{3}}$
 - 3) $\frac{1}{4}$
 - 4) $\frac{1}{2}$
5. $\int_0^1 \frac{xe^x}{(1+x)^2} dx =$
 - 1) $\frac{e-2}{2}$
 - 2) $e-2$
 - 3) $\frac{e-1}{2}$
 - 4) $e-1$



ANNEXURE - I PHYSICS

(Common Syllabus for all Diploma Holders in Engineering)

Unit-1:

Units and dimensions: Physical quantity-fundamental and derived physical quantities-units-fundamental and derived units-SI units-multiples and sub-multiples in SI-units-advantages of SI units-dimensions and dimensional formulae-dimensionless quantities- applications and limitations of dimensional analysis-problems.

Unit-2: Elements of vectors:

Scalar and vector quantities-examples-graphical representation of a vector-types of vectors-addition and subtraction of vectors-triangle law-parallelogram law and its cases-polygon law-resolution of a vector-unit vectors (i, j, k)-dot product and cross product of two vectors-characteristics of dot and cross products-examples-problems.

Unit-3: Kinematics and Friction

Equations of motion-acceleration due to gravity-equations of motion under gravity-expressions for maximum height, time of ascent, time of descent, time of flight, velocity on reaching the point of projection-motion of a body projected from the top of a tower-projectile motion-examples-horizontal and oblique projections-expressions for maximum height, time of ascent, time of flight, horizontal range, magnitude and direction of resultant velocity-problems.

Friction-normal reaction-laws of friction-coefficients of friction-angle of friction-methods of reducing friction-advantages and disadvantages of friction-motion of a body over a smooth inclined plane and a rough inclined plane-problems.

Unit-4: Work, Power and Energy

Work, power and energy-definitions and units-potential and kinetic energies-examples and expressions-law of conservation of energy-problems .

Unit-5: Simple harmonic motion and acoustics

Definition-conditions of SHM-examples of SHM-expressions for displacement, velocity, acceleration, time period, frequency and phase of SHM-time period of a simple pendulum-second's pendulum-problems. Sound-musical sound and noise-noise pollution-Effects and methods of control of Noise Pollution-Beats and echoe-problems-Doppler effect – Explanation, cases and Applications Acoustics of buildings-Reverberation-Sabines' formula- characteristics of a good building-problems.



Unit:6: Heat and Thermodynamics

Expansion of gases-Boyle's law-Absolute scale of temperature-charle's laws-Ideal gas equation-Universal gas constant and its value-SI Units-problems-external work done by a gas-isothermal process-adiabatic process-first law of thermodynamics and its applications to isothermal process and adiabatic process-two specific heats of a gas-relation between C_p and C_v -problems-second law of thermodynamics and its applications.

Unit:7 Modern Physics

Photoelectric effect – explanation and its laws-applications of photoelectric effect (photocell) – critical angle and total internal reflection – optical fibers - principle, working , types and applications-concept of super conductivity – its properties and applications.



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ANNEXURE - II

Number of Questions to be Set Unit Wise (TOTAL 25)

UNIT NO	TOPICS	MARKS
I	Units and Dimensions	02
II	Elements of Vectors	02
III	Kinematics and Friction	06
IV	Work, Power and Energy	03
V	Simple Harmonic Motion and Acoustics	05
VI	Heat and Thermodynamics	05
VII	Modern Physics	02
Total		25



ANNEXURE - III
MODEL QUESTIONS FOR PHYSICS

1. If young's modulus 'Y', surface tension 'S' and velocity 'V' are chosen as fundamental quantities, the dimensional formula for force is
 2. $Y^{-5}V^{-4}S^6$
 3. $Y^{-3}V^5S^5$
 4. $Y^{-5}V^{-4}S^5$
 5. $Y^{-3}V^{-4}S^6$
2. A ballon moves up with constant velocity 10m/s. An object is dropped from it when it is at a height of 100 m above the ground. The distance between the object and the ballon after 5 sec is ($g=10\text{m/s}^2$)
 1. 120 m
 2. 125 m
 3. 100 m
 4. 150 m
3. The time period of an oscillating simple pendulum is 'T'. If its length is increased by 5 cm then the time period is 'T₁' and the time period is 'T₂' if the length is reduced by 5 cm. The relationship among T, T₁, T₂
 1. $T^2 = T_1^2 + T_2^2$
 2. $T^2/2 = T_1^2 + T_2^2$
 3. $2T^2 = T_1^2 + T_2^2$
 4. $3T^2 = T_1^2 + T_2^2$
4. A gas is heated through 4 K in a closed vessel. If its pressure is increased by 0.8%, the initial temperature of the gas is
 1. 227 K
 2. 454 K
 3. 454 °C
 4. 227 °C
5. If light travels through two media with velocities $2.5 \times 10^8 \text{ m/s}$ and $2 \times 10^8 \text{ m/s}$ respectively, the critical angle for the combination of the two media is
 1. $\sin^{-1}(4/5)$
 2. $\sin^{-1}(3/5)$
 3. $\sin^{-1}(2/5)$
 4. $\sin^{-1}(1/5)$



ANNEXURE - I
CHEMISTRY
(Common for all branches of Diploma in Engineering)

1. Atomic Structure: Introduction-Fundamental particles – Bohr's theory – Quantum numbers — Aufbau principle – Hund's rule – Pauli's exclusion principle- Electronic configurations of elements up to atomic number 20, shapes of s,p,d orbitals.

2. Chemical Bonding:

Introduction – types of chemical bonds – Ionic bond taking example of NaCl and MgO – characteristics of ionic compounds and covalent bond taking example H₂, O₂, N₂, HCl characteristics of covalent compounds.

3. Solutions:

Introduction solution classification of solutions, solute, solvent, concentration, mole concept–Molarity, –Normality, equivalent weight using acids, bases and salts, numerical problems on Molarity and Normality.

4. Acids and Bases:

Introduction – theories of acids and bases – Arrhenius, Bronsted –Lowry theory – Lewis acid base theory – Ionic product of water - P^H and related numerical problems – buffers solutions – Applications.

5. Electrochemistry:

Conductors, insulators, electrolytes – electrolysis –Faraday's laws of electrolysis- numerical problems – Galvanic cell – standard electrode potential – electro chemical series –emf and numerical problems on emf of a cell.

6. Water Technology:

Introduction –soft and hard water – causes of hardness – types of hardness –disadvantages of hard water – degree of Hardness, units and its relations– softening methods – permutit process – ion exchange process –qualities of drinking water – municipal treatment of water for drinking purpose.

7. Corrosion:

Introduction - factors influencing corrosion - electrochemical theory of corrosion- composition cell, stress cell and concentration cells– rusting of iron and its mechanism – prevention of corrosion by a) coating methods, b) cathodic protection (sacrificial and impressed voltage methods).



8. Polymers:

Introduction – polymerisation – types of polymerisation – addition, condensation and co-polymerisation with examples – plastics – types of plastics – advantages of plastics over traditional materials – Disadvantages of using plastics, thermo plastics and thermo setting plastics – differences between thermo plastics and thermo setting plastics – preparation and uses of the following plastics : 1. Polythene 2. PVC 3. Teflon 4. Polystyrene 5. Urea formaldehyde – Rubber – natural rubber – processing from latex – Vulcanization – Elastomers – Buna-s, Neoprene rubber and their uses.

9. Fuels:

Definition and classification of fuels based on physical state and occurrence – characteristics of good fuel - Extraction and Refining of petroleum - composition and uses of gaseous fuels. A) water gas b) producer gas c) natural gas d) coal gas e) bio gas f) acetylene

10. Environmental chemistry

Introduction – environment – understand the terms lithosphere, hydrosphere, atmosphere biosphere, biotic component, energy component pollutant, receptor, sink, particulate, DO, BOD, Threshold limit value, COD- Air pollution - causes-Effects – acid rain, green house effect – ozone depletion – control of Air pollution – Water pollution – causes – effects – control measures.



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ANNEXURE - II

Number of Questions to be Set Unit Wise (TOTAL 25)

UNIT No	Topic	Marks
1.	Atomic Structure	3
2.	Chemical Bonding	2
3.	Solutions	3
4.	Acids and Bases	2
5.	Electrochemistry	4
6.	Water Technology	3
7.	Corrosion	2
8.	Polymers	3
9.	Fuels	1
10.	Environmental Chemistry	2
Total		25



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ANNEXURE - III
MODEL QUESTIONS FOR CHEMISTRY

1. The normality of oxalic acid solution is found to be 0.05N. How many grams of oxalic acid is present in 100 ml of solution.
 - 1) 1.26
 - 2) 12.6
 - 3) 126
 - 4) 0.126
2. Which of the following is responsible for temporary hardness of water
 - 1) Ca CO_3
 - 2) Ca Cl_2
 - 3) Ca SO_4
 - 4) $\text{Ca (HCO}_3)_2$
3. The monomer of Rubber is----
 - 1) Isoprene
 - 2) Propene
 - 3) Polyisoprene
 - 4) Bakelite
4. Which one of the following is responsible for Global Warming
 - 1) Particulate
 - 2) Carbon dioxide
 - 3) Hydrogen sulphide
 - 4) Nitrous Oxide