
DEGREE PROGRAMME (SET-III)

5. DEGREE PROGRAMME

Degree programme is a continuation of technical expertise acquired in corresponding Diploma programmes and offers an opportunity to Diploma holders to obtain Degree in Engineering.

- (a) **Entry Qualification:** All candidates who have passed Diploma course in any discipline from SLIET or from any other polytechnic affiliated with any State Board of Technical Education and approved by All India Council for Technical Education (AICTE), securing **55% marks (50% in case of candidates belonging to reserved categories)** are eligible to compete for admission to the appropriate Degree programmes as given in **Table 5.1**.
- (b) **Duration:** The duration of Degree programme is 3 years.
- (c) **Disciplines & Seats:** Available disciplines of study and information regarding distribution of seats are given in **Table 5.2**. **General principles relating to reservations are given in Section 2.9**.
- (d) **Admission Procedure:** There are two categories of seats in this programme as given in **Table 5.2**.
(i) Vertical Entry Seats (ii) Direct Entry Seats

The admission procedure to these two categories is as under:-

- (i) **Vertical Entry Seats (Only for SLIET students admitted in the year 2011):** There shall be vertical mobility of 50% of the sanctioned strength in each Diploma programme of SLIET to Degree programme. The linkage between Diploma and Degree modules is illustrated in **Table 5.3**. For vertical promotion from Diploma to Degree against these reserved seats, the Diploma students shall apply in Entrance Test (SET-III). Such students are required to apply through online mode. However, the students admitted under Persons with Disabilities (PWD) and Non Resident Indians (NRI) category will not be eligible for Vertical Entry Seats. A SLIET student will be eligible for admission under this category who had got admission to Diploma course in 2011-2012 and not earlier and had completed the Diploma course in the prescribed period of normal study i.e. two years and by availing only prescribed chances to clear a subject. The admission to these seats will be on the basis of merit of All India SLIET Entrance Test (SET-III) and linkage shown in **Table 5.3**.
- (ii) **Direct Entry Seats (For outside candidates and SLIET students):** All candidates possessing entry qualification prescribed as per **Table 5.1** are eligible to compete for direct entry seats for various Degree programmes as per **Table 5.2**. The admission to these seats is on the basis of merit of the All India SLIET Entrance Test (SET-III) conducted by the institute for the Degree programme.

Table 5.1

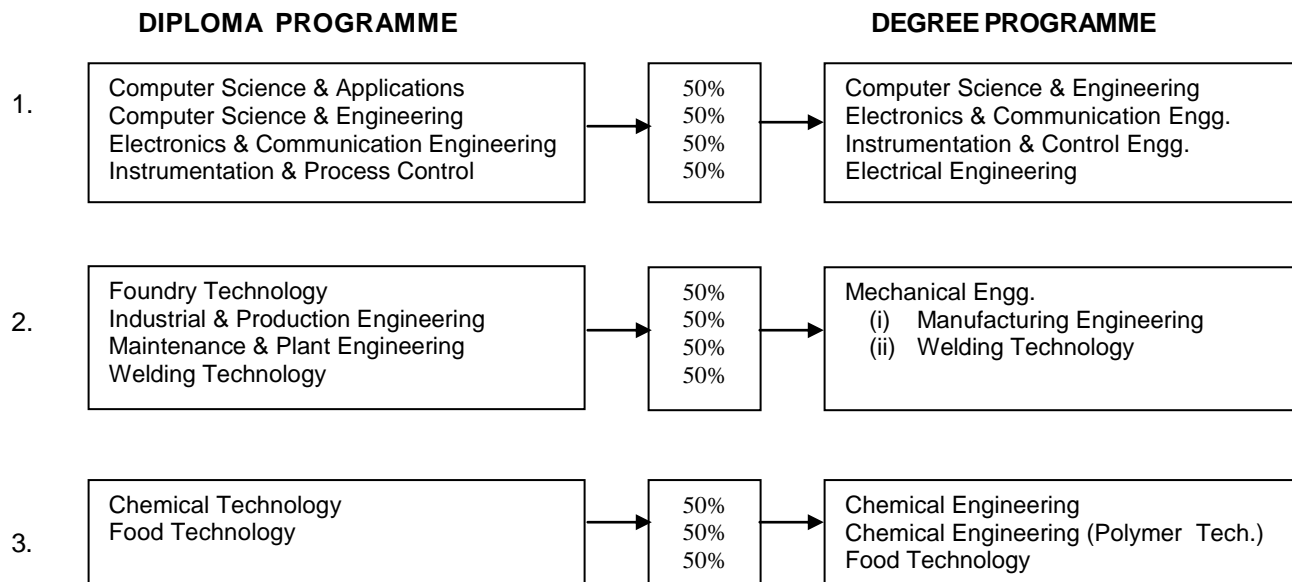
Engineering Group	Diploma Stream
<p>GROUP-A : Electrical, Electronics & Computer Group</p> <p>For Group-A, admission will be in following courses :</p> <ol style="list-style-type: none"> 1. Computer Science & Engineering (GCS) 2. Electronics & Communication Engg. (GEC) 3. Instrumentation & Control Engineering (GIN) 4. Information Technology (GIT) 5. Electrical Engineering (GEE) 	<p>Information Technology, Computer Science & Technology, Computer Engineering, Hardware Engineering / Technology, Software Engineering / Technology, Bio-Computer Engineering, Instrumentation & Measurement, Instrumentation Biomedical Engineering, Applied Electronics & Instrumentation, Telecommunication Engineering, Microwave Technology, Power Engineering, Electrical & Electronics Engineering, Instrumentation & Control Engineering, Electrical Engineering, Electronics & Communication Engineering, Computer Science & Applications, Instrumentation & Process Control</p> <p>OR</p> <p>Equivalent*</p>
<p>GROUP-B : Mechanical Group</p> <p>For Group-B, admission will be in following courses :</p> <ol style="list-style-type: none"> 1. Mechanical Engineering (Manufacturing Engineering) (GME) 2. Mechanical Engineering (Welding Technology) (GWT) 	<p>Material Science & Technology, Metallurgical Engineering, Metallurgy & Materials, Ceramic Engineering & Technology, Industrial Engineering, Automation and Robotics Engineering, Industrial Engineering & Management ,Automobile Engineering, Energy Management Technology, Non-conventional Engineering Technology, Manufacturing Engineering, Mechanical Engineering, Foundry Technology, Industrial & Production Engineering, Maintenance & Plant Engineering, Welding Technology</p> <p>OR</p> <p>Equivalent*.</p>
<p>GROUP-C : Chemical & Food Group</p> <p>For Group-C, admission will be in following courses :</p> <ol style="list-style-type: none"> 1. Chemical Engineering (Polymer Technology) (GCT-P) 2. Chemical Engineering (GCT) 3. Food Technology (GFT) 	<p>Petroleum, Petrochemical, Biotechnology, Food Technology, Biochemical Engineering, Pulp and Paper Technology, Sugar Technology, Leather Technology, Plastics & Rubber Technology, Polymer Engineering, Polymer-science & Rubber Technology, Oil Technology, Paint Technology, Food Engineering, Agricultural Engineering, Agricultural & Food Engineering, Food Processing, Chemical Engineering & Technology</p> <p>OR</p> <p>Equivalent*.</p>

*The decision of Admission Committee regarding equivalency shall be final and binding upon the candidate.

TABLE 5.2 : Distribution of Seats for Degree Programme for the Academic Session 2013-14

Sr. No.	Discipline	Sanctioned Seats	Seats for Vertical Entry		Seats for Direct Entry	
1.	Chemical Engineering (Polymer Tech.) (GCT-P)	45	11		34	
2.	Chemical Engineering (GCT)	46	12		34	
3.	Food Technology (GFT)	62	23		39	
4.	Computer Science & Engineering (GCS)	92	Max. 47	94	Min. 45	182
5.	Electronics & Communication Engineering (GEC)	62	Max. 24		Min. 38	
6.	Instrumentation & Control Engineering (GIN)	62	Max. 23		Min. 39	
7.	Electrical Engineering (GEE)	60	--		Max.60	
8.	(a) Mechanical Engineering–(Manufacturing Engg.) (GME)	62	46		16	
	(b) Mechanical Engineering–(Welding Technology) (GWT)	62	46		16	
9.	Information Technology (GIT)	46	00		46	
	TOTAL	599	232		367	

TABLE 5.3 : Linkage between various Diploma and Degree Programmes for Academic Session 2013-2014 (Vertical Entry)



(e) Principles of Vertical Admission (from Diploma to Degree)

Admission to the vertical entry seat shall be 50% of the sanctioned strength of the students in a particular Diploma Programme in 2011-2012 and not earlier. If a student from promoted candidates do not claim admission in a trade or a seat falls vacant afterwards in a trade, then that seat will be offered to next eligible candidate in that trade.

(f) Entrance Test Schedule :

Test	Date	Time
SET-III (Degree)	25 th May, 2013	10.00 – 12.30 Hours

(g) Fee Structure for Degree Programme (Itemized fee structure is in Section 2.10) :

FEE PARTICULARS		AMOUNT (In Rupees)
A.	REFUNDABLE FEE (Without any interest)	5000
B.	NON-REFUNDABLE FEE	7285
C.	OTHER FEE: (PER SEMESTER) (Non-Refundable)	19925
GRAND TOAL (A + B + C)		32210

For NRI/NRI sponsored in Degree Programme, the tuition fee and Institute Development Charges shall be as follows:

Tuition Fee	Institute Development Charges
US \$ 5000 per annum	US \$ 1000 per annum

Note : The fee structure may be revised from time to time with the approval of competent authority.

SYLLABUS OF SLIET ENTRANCE TEST (SET-III) FOR ADMISSION TO DEGREE PROGRAMME, 2013

PATTERN OF SET-III

SLIET Entrance Test (SET-III) for admission to Degree Programme will consist of one paper of two and half hours duration. This paper will have 150 objective type questions of 150 marks from English, General Knowledge, Mental Aptitude, Mathematics, Physics, Chemistry and Basics of Engineering (**appropriate group**).

Note : *Answers of the objective type questions are to be filled in the OMR answer sheet given separately during the Examination. There will be 25% negative marking for wrong answers.*

SYLLABUS AND MODEL QUESTIONS

Marks: 150

Time: 2½ Hours

GENERAL KNOWLEDGE, MENTAL APTITUDE & ENGLISH

Marks: 20 (20 Questions)

Syllabus :

The paper will include questions covering the following topics:-

1. General Science
2. Current events of National and International importance
3. History of India
4. Indian Politics and Economy
5. Indian National Movement
6. General Mental ability
7. Idioms/Phrases
8. Usage of Tenses
9. Change the form of Narration
10. Fill in the blanks with suitable words.

MATHEMATICS

Marks: 20 (20 Questions)

Syllabus :

Algebra : Solution of quadratic equations, relationship between their roots and coefficients. Equations reducible to quadratic equation. Symmetric Functions of roots. Formation of a quadratic equation with given roots. Arithmetic progression, Geometric progression and Arithmetico-Geometric series. Series of natural numbers ($\sum n$, $\sum n^2$, $\sum n^3$). Mathematical induction. Permutations and Combinations. Binomial theorem for any index.

Trigonometry : Trigonometric ratios and their relations. Trigonometric Identities. T-ratios of allied angles. Addition and Subtraction formulae. Transformation of product into sum or difference and vice-versa. T-ratios of multiple and sub-multiple angles. Heights and distances. Solution of Trigonometric Equations.

Coordinate Geometry : Rectangular Cartesian coordinates. Distance between two points. Section formulae. Locus of a point. Equation of a straight line in various forms. Angle between two given lines. Condition for two lines to be parallel or perpendicular. Distance of a point from a line. Line through point of intersection of two given lines. Concurrency of lines. Equation of a circle in various forms. Intersection of a circle with a straight line. Intersection of two circles. Equations of the parabola, ellipse and hyperbola in the standard forms.

Calculus : Function, its domain and range. Limit, continuity and differentiability of a function. Derivative of sum, difference, product and quotient of two functions. Derivative of algebraic, trigonometric, exponential, logarithmic, hyperbolic and Inverse trigonometric functions. Chain rule. Derivative of functions expressed in implicit and parametric forms. Logarithmic differentiation. Maxima & Minima. Equation of tangent and normal. Integration as the inverse process of differentiation. Integration by parts, by substitution and by partial fractions. Integration of rational and irrational functions. Definite integral and its application for the determination of area (simple cases).

CHEMISTRY

Marks: 15 (15 Questions)

Atoms, Molecules and Chemical Arithmetic : Symbols, formulae, oxidation, reduction, oxidation number, balancing of simple chemical equations, mole concept, empirical formulae and molecular formulae.

Chemical families – Periodic Properties: Mendeleev's and Modern periodic tables, classification of elements into s, p, d and f blocks, periodic properties (ionization potential, electron affinity, atomic and ionic radii, oxidation states).

Atomic Structure, Bonding and Molecular Structure: Bohr's theory, brief description of hydrogen spectrum, the wave nature of matter, de-Broglie's theory, Uncertainty principle, Quantum numbers, Pauli's exclusion principle, Hund's rule of maximum multiplicity, shapes of orbitals, electronic configuration of atoms upto atomic no. 30. Types of bonding (ionic, covalent and co-ordinate covalent), Lewis structure, VSEPR theory, orbital overlap and molecular shapes, hybridization (sp , sp^2 and sp^3) and molecular structure, hydrogen bond, metallic bond, Vander Waals forces.

PHYSICS

Marks: 15 (15 Questions)

Description of Motion : Motion in a straight line, uniform motion, speed and velocity, equation of motion in a straight line, position time graph, instantaneous velocity and acceleration, motion in two dimensions, projectile motion, uniform circular motion, torque, angular momentum, conservation of angular momentum, centripetal and centrifugal forces, centre for mass, motion of centre of mass and momentum conservation.

Moment of Inertia: Moment of Inertia (M.I.) of rigid body, radius of gyration, theorem of parallel and perpendicular axes, M.I. of a straight rod, circular ring, circular disc, relation between torque and M.I., kinetic energy, motion of point mass tied string to the wound on a cylinder, motion of cylinder rolling without slipping on an inclined plane.

Kinetic Theory of Gases: Boyle's and Charles's laws, gas equation, gas constant, pressure exerted by gas, kinetic energy of molecules, kinetic interpretation of temperature, derivation of gas laws from kinetic theory of gases.

Electromagnetic Waves, Atomic and Nuclear Physics: Production and properties of e.m. waves, e.m. spectrums, nature and velocity of e.m. waves, propagation of radio waves in earth's atmosphere, photoelectric effect, laws of photoelectric effect, production of x-rays, soft and hard x-rays, uses of x-rays, Radio activity laws, half life and average life for radioactive materials, nuclear fission and fusions.

Objective Type Questions

Fill the choice of the alternative you think to be correct answer in the OMR answer sheet.

- Q1. A ball thrown up is caught by the thrower 4s after start. The height to which the ball has risen is (assuming $g = 10 \text{ m/s}^2$)
 (a) 20 m (b) 10m (c) 400m (d) 2m
- Q2. What determines the nature of path followed by the particle?
 (a) speed (b) velocity (c) acceleration (d) none of these

BASICS OF ENGINEERING

GROUP – A (Electrical, Electronics and Computer Group)

Marks : 80 (80 Questions)

Operating System: Introduction to various operating systems, single user, multiuser, batch processing, time sharing, real time, multiprogramming and multiprocessing systems, distributed computing, resources management, memory management; **System Software:** Introduction, system software, application software, compilers, assemblers, loaders, linkers; **Application Development:** Algorithms and flowcharts, program writing, debugging and execution, compilation, interpretation, programming using C language, Object Oriented Programming concepts; **Information Technology (IT):** Internet and its applications, web browser, E-mail; **Data management and organization:** Introduction to databases, architecture and structure of DBMS, data models; **Introduction to data structure :** arrays, linked list, stacks and queues; **Computer Networks:** Applications, introduction to OSI and TCP/IP, Networking topologies/technologies; **Latest Technologies:** Latest processor and memory configurations and related technologies. **Software Engineering:** Software Development Life Cycle, Software metrics, Coding and Testing; **Computer System Architecture:** Number system, Boolean Algebra, K-map, Instruction formats, Addressing modes, I/O interfacing, Control unit organization, Pipelining, Cache and main memory, Modes of data transfer.

Conductors, semiconductors, insulators, Extrinsic & Intrinsic semiconductors. PN Junction Diode - its V-I characteristics, Rectifiers, filters. BJT - various transistor configurations, their input/output characteristics. FET, MOSFET their construction & characteristics. Modulation - Need & types of modulation (AM, FM, PM). Radio Receivers - TRF & superheterodyne. Pulse modulation PAM, PWM, PPM. Logic gates - Definition, symbols & truth table of NOR, OR, AND, NAND, EX-OR gates, various Flip Flops (SR, JK, T, D), Registers & Counters. Operational Amplifier - Inverting & Non inverting amplifiers, Op Amp as an inverter, scale changer, adder, subtractor, differentiator, integrator.

AC fundamentals: single phase, rms value, peak to peak value, average value. RL, RC & RLC circuits, Power & Power factor, power measurement. **DC & AC Bridges:** Wheatstone bridge, Maxwell's Bridge, De-Sauty's Bridge, Owen's Bridge, Kelvin's Double Bridge, Hay's Bridge. **Network Theorems:** Thevenin's, superposition, Norton, maximum power transfer theorem, reciprocity and Tellegen's theorems. **Electromagnetic & Magnetic circuits:** Principle of AC & DC machines and Transformers. **DC Circuits:** Circuit components (resistor, inductor and capacitors) and DC Circuits resonance. Errors in measurement system, Galvanometer, PMMC and Moving iron instruments, DC potentiometers, Multimeter, LED/LCD/Segment Displays, CRO, Basic components of instrumentation system, sensors & transducers, resistive, capacitive & inductive transducers. **Signal Conditioning:** A/D and D/A converters, filtering and impedance matching, operational amplifiers.

GROUP – B (Mechanical Group)

Marks : 80 (80 Questions)

Thermal Engineering: Basic concepts, thermodynamic properties: intrinsic and extrinsic, open, closed and isolated systems, heat and work, specific heat, thermal and thermodynamic equilibrium, Zeroth law and first law of thermodynamics, internal energy, entropy, enthalpy. Clausius and Kelvin-Planck statement of second law, different thermodynamic processes like isobaric, isochoric, isothermal. Elements of heat transfer, conduction, convection, radiation, simple problems.

Applied Mechanics, Strength of Material and Machine Design: Concept of mechanics and applied mechanics, laws of forces, moments, friction and laws of motion. Stress & strain, concept of load, tensile, compressive, shear stress, torsion, Bending Moments and strains. Columns, Springs, Beams, stress concentration, types of loading, theories of failure, factor of safety, endurance limit, efficiency of riveted and welded joints, keys and its types, stress in shafts, design of shafts (solid and hollow).

Fluid Mechanics: Concept of fluid, fluid mechanics and hydraulics, properties of fluid (viscosity, specific weight, specific volume, specific gravity) with their units. Pascal's law, concept of atmospheric pressure, gauge pressure, absolute pressure, vacuum and differential pressure.

Manufacturing Engineering & Management: Introduction and classification of engineering materials, thermal, chemical, electrical and mechanical properties of commonly used engineering materials. Purpose of heat treatment, various heat treatment processes like cyaniding, nitriding, hardening, case hardening, annealing, normalizing, tempering, heat treatment processes and their applications. Arc and gas welding processes, patterns, cores, basic foundry processes and powder metallurgy. Different machining operations, principles of operations, cutting tools and machine tools used to carry out turning, milling, drilling, shaping & planning operations. Quality control, control charts, acceptance sampling, TQM. Plant location, layout and line balancing. Types of plant layouts. Inventory control, Inventory classification, and EOQ and ABC analysis.

GROUP – C (Chemical and Food Group)

Marks : 80 (80 Questions)

Chemical Engineering Thermodynamics: Laws of thermodynamics, thermodynamic properties, general thermodynamic relationships. Application for open/closed systems and reversible/irreversible processes, Raoult's Law. Chemical reaction equilibrium.

Chemical Reaction Engineering: Molecularity and order of reaction, reaction kinetics, different types of ideal reactors and their performance equations.

Heat Transfer: Different modes of heat transfer with governing relationships, Fourier's law, Steady state heat transfer through plain and composite slab, Cylindrical and spherical surfaces, Natural and forced convection, Radiation heat transfer. Heat transfer equipments and their industrial applications.

Mass Transfer: Fick's law of diffusion, Mass transfer operations and their applications, Molecular diffusion, eddy diffusion, diffusion in solids. Simple (differential) distillation, Rectification (Fractionating column) distillation, crystallization, drying - Moisture content on dry and wet basis, Equilibrium moisture content, Constant and falling rate phase calculations, Critical moisture content, absorption, equipment for separation and industrial application.

Unit operations: Calculation of energy required in grinding by Rittinger's law and Bond's law, Mixing index, Rate of mixing, agitation, Constant rate filtration, constant pressure filtration, Filter cake compressibility, Centrifuge equipment like cream separator and clarifiers used in dairy industry, crystallization.

Fluid flow: Physical properties of fluid, Classification of fluid flow, Continuity equation, Bernoulli's theorem, Concept of Reynold's number and its determination, Flow through parallel plates and circular pipes, Different type of pumps like centrifugal, reciprocating, rotary and piston displacement pumps, Concept of viscosity, Newtonian and non-Newtonian fluids.

Material and Energy balance: Material and energy balance calculation in processes with recycle/bypass/purge.

Chemical Process Industries: Raw material and process description for the manufacturing of ammonia, urea, ammonium phosphate, cement, soda ash, caustic soda, glass, sulphuric acid, hydrochloric acid and nitric acid.

Process Instrumentations: Instruments for temperature, pressure, liquid level, flow and pH measurement.

Environmental Engineering and Safety: Different types of liquid, air and solid pollutions from industries, effect of chemical pollution on ecology and environment. Pollution control methods. Hazards from wastes, toxic gases, chemicals; symptoms and their remedial action. Fire, noise pollution in industry and their control.

Food Chemistry and Microbiology : Classification, physical and chemical properties of carbohydrates, proteins, lipids; types of pigments, vitamins and minerals; morphology, methods of reproduction and types of bacteria and fungi; microbiology of various food products.

Food Process Technology: Milling of cereals and pulses; oil extraction methods; standardization, homogenization and pasteurization of liquid milk; meat and poultry processing; production of alcoholic and non-alcoholic beverages; technology of manufacturing of fruits and vegetable products; different preservation techniques in foods.

Food Analysis and Quality Control : Quality attributes; food adulteration and its detection; physico-chemical and mechanical properties of foods; sensory evaluation; HACCP; Food Safety and Standards Act.