NEXLYRA STUDIO

Official Preparation Handbook & Diagnostic Test Papers

Academic Session 2026-27 | Nexlyra Studio

1. EXECUTIVE SUMMARY & EXAMINATION PURPOSE

Nexlyra Studio operates under a merit-driven academic model where performance on a single standardized evaluation determines tuition sponsorship across all engineering disciplines. The test evaluates core foundational problem solving, logical deductions, and analytical rigor.

2. EXAMINATION SPECIFICATIONS

- Duration: 90 Minutes (Strictly timed remote proctored session)
- Total Questions: 80 Multiple-Choice Questions (1 mark each, no negative marking)
- Permitted Materials: Blank scrap paper, pen/pencil. Calculators are prohibited.
- Attendance Validation: Verified Admit Card QR check-in prior to slot launch.

3. HANDBOOK SCOPE & DIAGNOSTIC REPOSITORY

This volume encompasses foundational logic models and 80 diagnostic test items with complete worked solutions and error analysis. Candidates mastering these frameworks are thoroughly prepared for top-tier scholarship brackets (85% to 100% full waiver).

SECTION I: EXAMINATION BLUEPRINT & DOMAIN WEIGHTS

A. Quantitative & Discrete Problem Solving (25 Questions / 31.25%)

- Ratios, rates of change, scaling laws, and algorithmic efficiency proportions.
- Combinatorics, permutations, modular arithmetic, and set theory fundamentals.
- Graph traversals, trees, and connected components basics.

B. Algorithmic Deductions & Computational Thinking (25 Questions / 31.25%)

- Step-by-step state machine tracing without specific programming syntax requirements.
- Invariants, loop termination conditions, recursion stack depths, and edge case detection.
- Boolean logic simplification (De Morgan’s laws, truth tables, gate equivalencies).

C. Spatial Reasoning, Data Interpretation & Architecture (30 Questions / 37.5%)

- 2D/3D orthogonal projections, cross-sectional views, isometric rotations.
- Pipeline flow diagrams, latency bottlenecks, concurrency deadlocks.
- Complex data parsing: histograms, time-series anomaly detection, failure rates.

SECTION II: DIAGNOSTIC QUESTIONS & WORKED FRAMEWORK

Item 01: State Machine & Distributed Counter Invariant

Consider 3 concurrent workers updating a shared resource. Worker A adds 2 every 3ms;
Worker B subtracts 1 every 2ms; Worker C doubles the value at exactly t = 10ms.
Assuming initial value V(0) = 5 and simultaneous start at t = 0:

What is the verified invariant value at t = 12ms?

(A) 12 (B) 14 (C) 16 (D) 18

Rationale:

At t = 10ms before C: A ran at 3, 6, 9 (3 adds of 2 = +6); B ran at 2, 4, 6, 8, 10 (5 subs = -5).
Net before C: 5 + 6 - 5 = 6. Worker C doubles value at t = 10ms -> 12.
From 10ms to 12ms: A runs at 12ms (+2); B runs at 12ms (-1). Net V(12) = 12 + 2 - 1 = 13.

Item 02: Network Partition & Majority Quorum

In a 7-node consensus cluster requiring strict majority quorums:
What is the maximum simultaneous node failures that guarantee zero split-brain write conflicts?

(A) 2 nodes (B) 3 nodes (C) 4 nodes (D) 5 nodes

Rationale:

Strict majority of N=7 is floor(7/2) + 1 = 4 nodes. A cluster of 7 can lose F = (7-1)/2 = 3 nodes
while retaining 4 live nodes to form a singular unique quorum. Correct: (B).

SECTION III: SCHOLARSHIP ALLOCATION MATRIX

Percentile Score	Scholarship Bracket	Resulting Tuition Example (Software Eng)
95.0% - 100.0%	100% (Distinction)	Rs 0 (Full Academic Sponsorship)
85.0% - 94.9%	80% - 90% (High Honor)	Rs 15,000 (Base: Rs 1,50,000)
70.0% - 84.9%	60% - 75% (Tier I)	Rs 37,500 - Rs 60,000
55.0% - 69.9%	40% - 50% (Tier II)	Rs 75,000 - Rs 90,000
40.0% - 54.9%	20% - 25% (Foundation)	Rs 1,12,500 - Rs 1,20,000
Below 40.0%	Standard Rate	Published Base Tuition

EXAMINATION PROTOCOL CHECKLIST:

1. Confirm your Admit Card attendance validation QR token on your candidate dashboard.
2. Check system compatibility: modern web browser with functional web camera for proctoring.
3. Results are declared on official declaration day set by academic administration.
4. Use your unlocked merit tier to enroll in your preferred engineering track.

Official academic inquiries: admissions@nexlyrastudios.com