

IITDH/C&S/2025-26/LPC/08

18th June 2025

NOTICE INVITING QUOTATIONS FOR LOCAL PURCHASE

Platform to conduct students assessment tests

1.	Description		Procurement of “Platform to conduct pre placement assessment test for students” of Indian Institute of Technology Dharwad
2.	Quantity		350 user login IDs [2 sessions per user]
3.	Procurement Category		Services
4.	Procurement Type		Local Purchase
5.	Submission of Quotation: By email to: “ cs.office@iitdh.ac.in ” By hand to: Assistant Registrar, Contract & Services		
6.	Start Date to submit the quotation: 18 th June 2025 from 01:00 PM		
7.	Last Date to submit the quotation: 27 th June 2025 till 01:00 PM		
8.	Cover No.	Cover Type	Description
	1	Financial/Price	Commercial Bid
9.	Bid Validity (Days):		30 Days
10.	Contract Period		03 months (02 Sessions should be completed for each students within 03 months as per the schedule decided by IIT dhArwAD)
11.	Payment Terms		Within 30 days from the date of Satisfactory completion of services and submission of the satisfactory services completion report
12.	Delivery Location		IIT dhArwAD Permanent Campus, ChikkamalligawAD, dhArwAD-580011, Karnataka, India
13.	Pin Code		580011
14.	Quotation Inviting Authority:		Assistant Registrar (Contract & Services), IIT dhArwAD Address: IIT dhArwAD Permanent Campus, ChikkamalligawAD, dhArwAD-580011, Karnataka, India

Scope of work for Pre Placement Assessment Test and reporting

The following modules are to be delivered with the question banks for the syllabus mentioned below. The Tests will be conducted for 350 students in 2 phases/ sessions on separate dates. The final consolidated assessment reports should be generated and shared with the CDC team as well as students over email.

1. ENGLISH COMPREHENSION (Verbal Reasoning)

The module evaluates written English skills and is aimed at determining the candidate's ability to understand (a) the written text (b) the spoken word and (c) the ability to communicate effectively through written documents.

Detailed Syllabus:

- a. Vocabulary
 - Synonyms
 - Antonyms
- b. Grammar
 - Subject-Verb Agreement
 - Tenses and Articles
 - Prepositions and Conjunctions
 - Speech and Voices
- c. Comprehension
 - Inferential and Literal Comprehension
 - Contextual Vocabulary
 - Comprehension ordering

2. LOGICAL REASONING

The module assesses capacity of an individual to interpret things objectively, to be able to perceive and interpret trends to make generalizations and be able to analyse assumptions behind an argument/statement.

Detailed Syllabus:

- a. Deductive Reasoning
 - Coding deductive logic
 - Directional sense, Blood relations
 - Objective Reasoning
 - Selection decision tables
 - Puzzles
- b. Inductive reasoning
 - Coding pattern and Number series pattern recognition
 - Analogy and Classification pattern recognition
- c. Abductive Reasoning
 - Logical word sequence
 - Data sufficiency

3. QUANTITATIVE ABILITY

The module is ideal to evaluate the numerical ability of an individual and is available in both technical and non-technical flavour.

Detailed Syllabus:

- a. Basic Mathematics
 - Divisibility
 - HCF and LCM
 - Numbers, decimal fractions and power
- b. Applied Mathematics
 - Profit and Loss
 - Simple and Compound Interest
 - Time, Speed and Distance
- c. Engineering Mathematics
 - Logarithms
 - Permutation and Combinations
 - Probability

4. COMPUTER PROGRAMMING

The module is ideal to evaluate entry level talents exposure and expertise in Computer Programming. This module is agnostic to programming languages and does not require the candidates to code during the test.

Detailed Syllabus:

- a. Basic Programming
 - Data Types
 - Iteration, Recursion, Decision
 - Procedure, functions and scope
- b. Data Structures
 - Arrays, Linked Lists, Trees, Graphs
 - Stacks, Queues
 - Hash Tables
 - Heaps
- c. OOPs
 - Polymorphism
 - Abstraction
 - Encapsulation
- d. Miscellaneous
 - Searching and Sorting
 - Complexity Theory

5. DEBUGGING

In this module, the candidate has to fix logical/syntax error of the code or complete the given code by reusing existing functions.

Detailed Syllabus:

- Basic programming
- Control Structures
- conditional statements
- Linear data structures
- Advanced data structures
- Sorting and searching algorithms

Question Type	Description
Logical	The candidate is required to fix all logical errors in the given code. This checks the various logical concepts like conditions, looping etc
Compilation	Candidate needs to correct the syntax of the given code without changing its logic. This checks the candidate basic knowledge of syntax and language specific concepts.
Code reuse	Candidate needs to complete the given code by reusing existing functions. This is a bit tougher than the logical and compilation-based questions. The candidate is required to

6. PROGRAMMING TOOLS

Programming tools is a path breaking tool to evaluate programming skills in a simulated environment. The assessment should allow evaluation of actual programming skills of a candidate, giving the candidate an opportunity to write the program in an editor, compile and run test cases, all in the assessment environment itself. The compiler should support multiple programming languages such as C, C++, Java, Python etc.

Some of the unique features of Programming tools include:

- With a variety of basic, advanced and edge test cases designed for a problem, the code is checked thoroughly for correctness and completeness.
- It is capable of evaluating the time complexity or simply the efficiency of the code.
- The code is scored on quality of the code based on industry defined best practice.
- A detailed report with objective and subjective evaluation of the code.

Data Structure Concepts	
Array and Matrices	1D array
	Array Rotations
	Arrangement and rearrangement of elements of array
	Properties of matrices
	Inverting matrices
	Transpose of the matrix
Linked list	Basic operations on linked list
	Circular linked list
String processing and manipulation	Basic string operations
	Pattern searching
Stack/Queue	Basic stack operations
	Basic queue operations
Sorting and searching	linear and binary search
	various sorting concepts
Advanced Design and Analysis Techniques	
Greedy Algorithms	activity-selection problem
	fractional knapsack
Minimum Spanning Trees	Kruskal
	Prim
String Matching	The naive string-matching algorithm
Divide and conquer	Sorting algorithms
	Binary Search
Computational Geometry	Line-segment properties
	Intersection of line segment

7. ELECTRICAL ENGINEERING

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Fundamentals of Electrical Engineering
 - Basic electrical engineering
 - Electrical machines
 - Power machines
- b. Instrumentation and control
 - Instruments and measurements
 - Control system
- c. Electronics
 - Analog and digital electronics
 - Power electronics
 - Microprocessor and microcontroller
- d. Semiconductors and Devices
 - Basics of semiconductor
 - Two terminal devices
 - Three terminal devices
- e. Analog Electronics
 - Basic for circuit analysis
 - Small Signal and Large Signal Circuit Analysis
 - Feedback, stability and oscillators
 - Op-amps
 - Filters
- f. Digital Electronics
 - Boolean Algebra and minimization of Boolean functions
 - Logic families
 - Combinational Circuits
 - VLSI
- g. Signals and Communication System
 - Signal and systems
 - Communications
 - Fundamentals of network analysis and synthesis
- h. Instrumentation and Control
 - Transducers and industrial instrumentation
 - Analytical and optical instrumentation
 - Electronic instrumentation and measurements
 - Control systems and process control

8. MECHANICAL ENGINEERING

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Manufacturing Science
 - Engineering materials
 - Production engineering
 - CAD/CAM
 - Industrial engineering
- b. Thermodynamics and IC Engines
 - Thermodynamic cycles and steam generators
 - IC engines
 - Heat transfer, refrigeration and air conditioning
 - Metallurgical thermodynamics
- c. Fluid and Machine Mechanics
 - Fluid mechanics and fluid machinery Strength of materials
 - Theory of machines
 - Machine design
- d. Physical Metallurgy
 - Nonferrous materials
 - Phase transformation and heat treatment
 - Material testing and characterization
- e. Production Technology and Analysis
 - Metal casting, forming and joining
 - Manufacturing Analysis
- f. Metal Cutting and Tool Design
 - Machining and machine tool operators Tool engineering
 - Metrology and inspection
- g. Material Science and CIM
 - Polymers and composites
 - Computer integrated manufacturing

9. CIVIL ENGINEERING

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Structural Engineering
 - Applied mechanics
 - Strength of materials
 - Building materials and construction
 - Theory of structures

- Steel structures
- Concrete technology
- R.C.C. Design
- b. Geotechnical and Water Resources Engineering
 - Soil mechanics
 - Hydraulic engineering
 - Water supply engineering
- c. Transportation Engineering and Surveying
 - Highways engineering
 - Railway engineering
 - Estimation and costing
 - Surveying

10. Chemical Engineering

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Biomolecules
 - Amino Acids
 - Proteins
 - Enzymes
 - Carbohydrates
 - Lipids
 - Vitamins
 - Nucleic Acids
 - Nucleotide
- b. Polymer Chemistry and Characterization
 - Chemistry of polymers
 - Polymer characterization
- c. Petrochemicals
 - Chemical Processes & Engineering
 - Chemical Reaction Engineering
 - Polymer Technology
 - Organic chemistry and calculations
- d. Physical Chemistry
 - Electrochemistry
 - Chemical kinetics
 - Chemical bonding
 - Chemical Thermodynamics
 - Heat and Mass transfer

11. COMPUTER SCIENCE

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Operating System & Computer Architecture
 - Basics of Operating System
 - Process Management
 - Process Communication & Synchronization
 - Memory Management
 - I/O File Management
 - Computer Architecture
- b. DBMS
 - Basic Concepts
 - Data Model, Operation, Views & Architecture
 - Normalization
 - Generalization, ERD, Key
 - Database, SQL, Joins & Indexing
- c. Computer Networks
 - Basics of computer networks
 - Networks and communication
 - Routing
 - Reference Network Model & protocols
- d. AI/ML
- e. Data Analysis

12. Engineering Physics

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Electronic Devices
 - Semiconductor Physics
 - Bipolar Junction Transistors
- b. Analog Electronics
 - Basic for circuit analysis
 - Small Signal and Large Signal Circuit Analysis
 - Feedback, stability and oscillators
 - Op-amps
 - Filters

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 - Op-amps
 - Filters
- d. Semiconductors and Devices
 - Basics of semiconductor
 - Two terminal devices
 - Three terminal devices
- e. Digital Electronics
 - Boolean Algebra and minimization of Boolean functions
 - Logic families
 - Combinational Circuits
 - VLSI
- f. Signals and Communication System
 - Signal and systems
 - Communications
 - Fundamentals of network analysis and synthesis
- g. Electrodynamics
 - Electromagnetic Waves
 - Maxwell Equation

13. Mathematics & Computing

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

Computer Architecture
AI/ML
Data Science/Analysis
Statistics
Linear Algebra
Group Theory
Probability
Graph Theory

Data Structures and Algorithms

14. Chemistry

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Biomolecules
 - Amino Acids

- Proteins
- Enzymes
- Carbohydrates
- Lipids
- Vitamins
- Nucleic Acids
- Nucleotide
- b. Inorganic Chemistry
 - Periodic table and periodic properties
 - Atomic Structure
 - Coordination compounds
- c. Organic Chemistry
 - Basic Concepts
 - Purification and characterization of organic compounds
 - Types of organic reactions

15. Biology

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Molecular Biology
 - Genome structure & organization
 - DNA replication & repair
 - Chromosome & nucleic acids Transcription
 - Translation
 - Gene expression in prokaryotes & eukaryotes
 - Mutations
 - Cloning & vectors used in cloning • Enzymes used in rDNA technology
 - Sequencing techniques
 - Transgenics
 - DNA libraries
 - Mendelism
 - Chromosomal basis of inheritance
 - Gene & the genome
 - Genetic variations & gene mapping
 - Transformation & related processes
- b. Biomolecules
 - Amino Acids
 - Proteins
 - Enzymes
 - Carbohydrates
 - Lipids
 - Vitamins
 - Nucleic Acids

- Nucleotide
- Bioenergetics
- Metabolism
- c. Biotech Lab Techniques
 - Crystallography
 - Microscopy
 - Radioactivity
 - Spectrometry
 - Spectroscopy
 - Bioreactors & Bio processing
 - Bioreactors & fermenters
 - Downstream processing
 - Fermentation process
 - Types of fermentation
 - Upstream processing
 - Chromatography
 - Electrophoresis

16. Physics

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- a. Basics of Physics
- b. Biomolecules
 - Amino Acids
 - Proteins
 - Enzymes
 - Carbohydrates
 - Lipids
 - Vitamins
 - Nucleic Acids
 - Nucleotide
 - Bioenergetics
 - Metabolism
- c. Electrodynamics
 - Electromagnetic Waves
 - Maxwell Equation

17. Mathematics

The module focuses on testing a student on theoretical knowledge as well as practical concepts of their core domain.

Detailed Syllabus:

- Graph Theory
- Calculus
- Linear Algebra
- General Topology
- Numerical Analysis
- Probability
- Data Analysis

For any feedback/queries/clarification

Kindly reach out to us at: cdc.office@iitdh.ac.in or cs.office@iitdh.ac.in.