

**Preamble:**

**The first official Talent Competition started in the year 1968.**

**55<sup>th</sup>**  
**NATIONAL**  
**MATHEMATICS**  
**TALENT CONTESTS**

Organised by



**The Association of**  
**Mathematics Teachers of India**

Established in 1965

**Last date for Response:**

**31<sup>st</sup> August 2023**

**Office**

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New No : 85, Old No : 37, Venkatarangam Street,

Triplicane, Chennai – 600 005.

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Website: [amtionline.com](http://amtionline.com)

For more details, please see our website (Under NMTC head)

The **AMTI** is a pioneer organization in promoting and conducting Mathematics Talent Tests in India. Last year (in the 54th National level tests), in spite of prevailing pandemic, 30347 students spread all over India participated at the screening level. About 10% of them were selected for the finals. Merit certificates and prizes were awarded to the deserving students selected in the final.

**We now announce  
the 55th National Level Competition**

**AIM OF THE TESTS:**

To identify and encourage students who have the capacity for original and creative thinking, willingness to attempt unfamiliar and non-routine problems, exhibiting a general mathematical ability appropriate to their level.

**PARTICIPANTS:**

Students from Schools, Junior Colleges of all boards, Degree Colleges and Technical Institutions in India.

Primary	Gauss Contest	V and VI Standards
Sub-Junior	Kaprekar Contest	VII and VIII Standards
Junior	Bhaskara Contest	IX and X Standards
Inter	Ramanujan Contest	XI and XII Standards
Senior	Aryabhata Contest	Degree Classes in Arts, Science & Technical Institutions

**MEDIUM:**

The medium will be only ENGLISH (for all levels).

## **FEES :**

**Rs.150/- per candidate** ( Out of this, Rs.125/- per candidate should be sent to AMTI, and the Institution retaining Rs.25/- per candidate for all expenses, including the download and printing the question papers from the mail supply of the answer sheets and the invigilation charges. **No further claim can be made by the institution for any type of expenses**).

## **SYLLABUS:**

Recommended topics for NMTC exam

### **PRIMARY:**

(Gauss Contest - V and VI Standards)

**ARITHMETIC:** Fractions, percentages, profit and loss, tests of divisibility, LCM, HCF, Ratio and proportion, Calendar

**MENSURATION:** Triangles, Quadrilaterals, Circles.

**ALGEBRA:** Algebra as literal Arithmetic, Addition, subtraction, multiplication and division of simple Arithmetic expressions.

**GEOMETRY:** Straight lines, parallel lines, Angle properties of triangles, quadrilaterals and polygons.

### **SUB JUNIOR:**

(Kaprekar Contest - VII and VIII Standards)

All the topics for primary and,

**ARITHMETIC:** Square roots and cube roots, Allegation, average , time and work, time and distance, Races, Games of skill, Travelling around a circle.

**MENSURATION:** Three Dimensional: cubes, cuboids, sphere, cone, cylinder, pyramids.

**ALGEBRA:** Algebraic equations of degree 1 and degree 2. Algebraic identities, factorization of algebraic expressions, laws of indices, basics of surds.

**GEOMETRY:** Triangle inequalities, parallelograms, trapezoids, Pythagoras theorem.

**NUMBER THEORY:** Prime and composite numbers, divisibility.

[Note: Apart from these, the children shall practise to solve logical questions in basic mathematics].

## **JUNIOR:**

(Bhaskara Contest - IX and X Standards)

All the topics for Primary, Sub junior and the following:

**ALGEBRA:** Quadratic and Higher degree Algebraic equations, Remainder theorem, Logarithms, Sequences and series, Scales of notations, Mathematical Induction, Basic inequalities.

**GEOMETRY:** Circle theorems, Chords, Arcs, Angles in segments, Cyclic Quadrilaterals, Tangents, Alternate Segment theorem, intersecting chord theorem, Apollonius theorem, and Stewart's theorem.

**NUMBER THEORY:** Modular arithmetic, Greatest Integer function, least integer functions.

**COMBINATORICS:** Fundamental principle of counting, Basics of permutations and combinations, Principle of inclusion and exclusion, Pigeon hole principle.

## **INTER:**

(Ramanujan Contest - XI and XII Standards)

All the topics for Primary, Sub Junior, Junior and the following:

**ALGEBRA:** Polynomials, inequalities, (C-S inequality), Functional equations.

**GEOMETRY:** Trigonometry, vector, Coordinate Geometric and Complex number methods may be used.

**NUMBER THEORY:** Fermat and Wilson theorem, Diophantine equations.

**COMBINATORICS:** Counting techniques, Recurrence relations.

## **SENIOR:**

(ARYABHATTA CONTEST FOR COLLEGE LEVEL):

It is a three hours examination of subjective questions with the syllabus of typical B.Sc. Mathematics course.

## MODE OF EXAMINATION

- ❖ *Every candidate except the senior level will take two tests- **Preliminary Test** and **Final Test**.*
- ❖ *Senior (Degree College) level students will take only the final test.*
- ❖ *The date and time of the examination stipulated by AMTI should be strictly followed and cannot be altered by the centers.*

### PRELIMINARY TEST:

The Preliminary test will be conducted in the participating schools itself by the school. AMTI will send the question paper and the other materials to the school mail. The Principal or the authorized school person may download the question paper and the materials and conduct the preliminary examination.

The top 10% of students based on the Preliminary test performance will be selected by the respective schools.

- **Preliminary test will be of objective type for Primary, Sub-Junior, Junior and Inter levels and will be of 2 hours duration.**
- As the objective of the Competition is to spot out, encourage and recognize the young talents, the papers will be set to match these objectives.
- In order to encourage the participation of students from various institutions following various curriculums across the Nation, the question papers in the first level will comprise of questions that test their problem solving skills in their respective levels.
- The Preliminary level questions will comprise of Multiple choice , Fill in the blanks problems, etc. roughly with the following levels of difficulty:

- 20% of the questions that are of moderate level
- 80% of questions with higher level of difficulty, somewhat similar to Olympiad.

The responses in the preliminary test will be written in the response sheets which will be provided by the AMTI. The institution will conduct the preliminary test in its own premises; the objective type preliminary papers will also be evaluated **by the respective institutions** (based on the key that will be supplied by AMTI on the next day of preliminary exam.) and **the list of top 10% scorers only** at each level in the Preliminary Test will be intimated to us.

**Important Note:** If more students qualify for any level from an institution, please use your discretion to shortlist and **send only 10%** to AMTI. In case, additional names are communicated to AMTI, the excess students over and above 10%, will be dropped by us.

Students selected at the Preliminary level test will get certificates which may be treated as the **Hall Ticket** for the final examination.

### **FINAL (SECOND LEVEL) TEST:**

Only the candidates selected at the preliminary level can appear for the final.

It is 3-hours test of subjective type questions reflecting the syllabi of PRMO, RMO, INMO and IMO.

The final examination will be held in their respective Institutions.

AMTI will send the question paper and the other materials to the school mail. The Principal or the authorized school person may download the question paper and the materials and conduct the final examination.

### Special Note:

Answer books of the final test containing the solutions written by participants should be dispatched on the same day of the examination and delayed receipts will not be entertained.

Answer sheets (un-ruled only, preferably A4 size) for the Final test have to be supplied by the respective schools.

**The date and time of the examination cannot be altered by the centers on any account.**

TIME SCHEDULE	
Last Date for entries	31 <sup>st</sup> August 2023
Stage-1 <b>Preliminary Test</b>	<b>07<sup>th</sup> October 2023</b> <b>(Saturday) 10 a.m. to 12 noon.</b>
Declaration of results of Stage-1 test	21 <sup>st</sup> October 2023
Stage-2 <b>Final Test – Tentatively on</b>	<b>04<sup>th</sup> November 2023</b> <b>(Saturday) 10 a.m. to 1 p.m.</b>
Dispatch of Answer Books from the Centres to AMTI	The same day (Speed Post or courier)
Announcement of Results	First week of December 2023

**\* Late entries may not be entertained**

**THE DECISION OF THE AMTI IS FINAL IN ALL MATTERS.**

### FOLLOW UP PROGRAMME:

Cash Awards to the top **3 winners** in each level at the finals, (**1<sup>st</sup> position Rs.5000/-**, **2<sup>nd</sup> Rs.2500/-** and **3<sup>rd</sup> Rs.1250/-**), Merit Certificates for them and others selected at the final level with Rs. 500/- cash award for the latter also will be given based on their revealing a reasonable level of mathematical maturity. Enrichment

contact courses are likely to be organized for the promising toppers. Prizes and the Merit Certificates will be distributed to all the prize winners during our AMTI ANNUAL CONFERENCE in December 2023. Details of our conference will be sent to the prize winners separately.

### **How to apply:**

#### **Institutions:**

- Download the **Data Consolidation Sheet** and **Excel format of name list** from our website - **amtionline.com** under the head “NMTC”.
- The school should fill up both **Data Consolidation Sheet** and **Excel format of name list**.
- Filled **Data Consolidation Sheet** and **Excel format of name list (only excel format accepted)** send it to AMTI through email **support@amtionline.com** along with the details of fees transfer.
- **Incomplete entries are not acceptable.**
- Fill in the details in English.
- Amount transfer appropriately (**Online account transfer (NEFT, IMPS, etc.)**) (Namely, Rs. 125 × number of entries – only for institutions).

**Name :**

**“The Association of Mathematics Teachers of India”**

**Type : Savings**

**Bank : Axis Bank**

**Account Type : Saving account**

**Account Number : 920010074677919**

**IFSC code : UTIB0000006**

**Branch : Mylapore, Chennai-600004.**

- Registration will not be done without payment completed properly.



- The amount paid once is **NOT REFUNDABLE** on any account.

### **POINTS TO REMEMBER: NMTC 2023-24**

- Read the details of 2023-24 NMTC.
- Fill in the Application Form with *relevant* details properly.
- Make the *payment by online* to complete your registration.
- *Keep checking our website for updates* and further information on NMTC 2023-24.

### **ADDITIONAL POINTS TO NOTE**

1. Entries in the proforma given only will be processed.
2. Last date of receipt at Chennai office will be **31.08.2023**.
3. The exact registered name of the institution should be incorporated in the application form. There have been instances of names not registered suitably with post offices and banks as our communications were not delivered.
4. The final examination will be held in their respective Institutions.
5. Results are declared after taking enough care, checking and cross checking only. No claim for change communication of individual scores etc., will be entertained.
6. Every effort is taken by AMTI to communicate particulars well on time. Individual reminders (by telephone or email) cannot be done except in cases of emergency.
7. This being a talent contest at all India level for final, marks alone do not speak. We may decide merit holders by interviews also, if found necessary.

### **A few recommended books for Guidance :**

1. **AMTI PUBLICATIONS:** Available at AMTI office. Contact: [support@amtionline.com](mailto:support@amtionline.com). (See our website [amtionline.com](http://amtionline.com) under the head of “Book list”)
2. Combinatorics for Mathematical Olympiads by Dr. S. Muralidaran. Contact [support@amtionline.com](mailto:support@amtionline.com).
3. Problem solving strategies by Arthur Engel.
4. Elements of Geometry (Part I –VI) by S. Barnard, J.M. Child
5. Mathematical circles (Russian Experience) by Dmitri et al
6. Olympiad Maths by M.K. Singhal and A.R. Singhal
7. Elementary Trigonometry by H.S.Hall & S.R. Knight
8. Elementary Algebra for School, by H.S. Hall and S.R. Knight
9. Challenge and Thrill of Pre college Mathematics, V. Krishnamurthy et al, New Age International Publishers
10. Adventures in Problem solving by Shirali Shailesh, University Press.

**DR. R. SANTHI**  
Secretary Talents Exams.,  
AMTI

**DR. M. PALANIVASAN**  
General Secretary,  
AMTI