RMO - 2016

A Detailed Analysis by Resonance

The Mathematical Olympiad Programme in India, which leads to participation of Indian students in the International Mathematical Olympiad (IMO) is organized by the **Homi Bhabha Centre for Science Education (HBCSE)** on behalf of the National Board for Higher Mathematics (NBHM) of the Department of Atomic Energy (DAE), Government of India. This programme is one of the major initiatives undertaken by the NBHM. Its main purpose is to spot mathematical talent among pre-university students in the country.

For the purpose of training and selection of students for the Olympiad contest, 25 regions all over the country have been designated and each assigned a Regional Coordinator (RC). Additionally, three groups (Central Board of Secondary Education (CBSE), Navodaya Vidyalaya Samiti (NVS) and Kendriya Vidyalaya Sangathana (KVS) have a 'Regional Coordinator' each. The Mathematical Olympiad programme consists of five stages.

STAGES

Stage 1:

The first stage examination, the Regional Mathematical Olympiad (RMO) is a three hour examination with six problems. The RMOs are offered in English, Hindi and other regional languages as deemed appropriate by the respective RCs. The syllabus may be found at (give syllabus link). The problems under each topic involve high level of difficulty and sophistication.

Stage 2:

The best-performing students from the RMO (approximately 900) qualify for the second stage – the Indian National Mathematical Olympiad (INMO). The INMO is held on the third Sunday of January at 28 centres across the country.

Stage 3:

The top students from the RMO (approximately 35) are invited for the third stage, the International Mathematical Olympiad Training Camp (IMOTC) held at HBCSE during April to May. At this camp orientation is provided to students for the International Mathematical Olympiad (IMO). Emphasis is laid on developing conceptual foundations and problem-solving skills. Several selection tests are held during this camp. On the basis of perfromance in these tests six students are selected to represent India at the IMO. Resource persons from different institutions across the country are invited to the training camps.

Stage 4:

The selected team undergoes a rigorous training programme for about 8-10 days at HBCSE prior to its departure for the IMO.

Stage 5:

The Olympiad programme culminates with the participation of the students in the IMO. The students are accompanied by 4 teachers or mentors.

Eligibility: All Indian students who are born on or after August 1, 1997 and, in addition, are in Class XI or below are eligible to appear for the RMO 2016 (leading to International Olympiads in 2017). Class XII students will not be eligible to appear for RMO/pre-RMO.

Syllabus: The syllabus for Mathematical Olympiad (regional, national and international) is pre-degree college mathematics. The areas covered are arithmetic of integers, geometry, quadratic equations and expressions, trigonometry, co-ordinate geometry, system of linear equations, permutations and combination, factorization of polynomial, inequalities, elementary combinatorics, probability theory and number theory, finite series and complex numbers and elementary graph theory. The syllabus does not include calculus and statistics. The major areas from which problems are given are algebra, combinatorics and geometry and number theory. The syllabus is in a sense spread over Class XI to Class XII levels, but the problems under each topic involve high level of difficulty and sophistication. The difficulty level increases from RMO to INMO to IMO.

EXAM STRUCTURE

RMO has six to eight problems (differ from region to region) that students have to solve in three hours. Following is the region wise paper pattern.

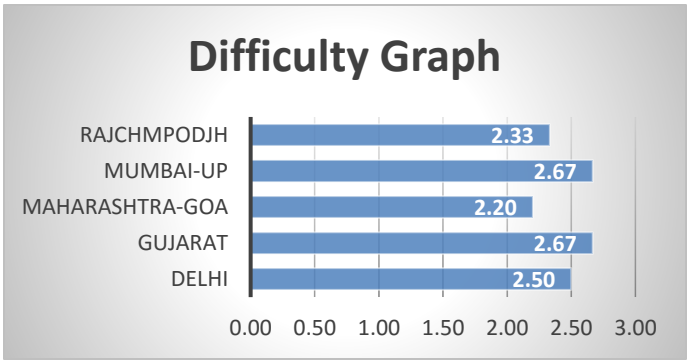
Region	Number of Questions	Total Marks
Delhi	6	102
Gujarat	6	102
Maharashtra, Goa	6	100
Mumbai and UP	6	102
Rajasthan, Chattisgarh, Jharkhand, Odisha and Madhya Pradesh	6	102

OVERALL DIFFICULTY LEVEL ANALYSIS

In this analysis we have rated every question on a scale of 1 to 3. The ratings are done by expert faculty of Resonance. The individual ratings are then averaged to calculate overall difficulty level.

- 1: Easy
- 2: Moderate
- 3: Difficult

Region	Aggregate Difficulty
Delhi	2.50
Gujarat	2.67
Maharashtra-Goa	2.20
Mumbai-UP	2.67
RajCHMPOdJH	2.33



*RajCHMPOdJH: Rajasthan, Chattisgarh, Madhya Pradesh, Odisha and Jharkhand

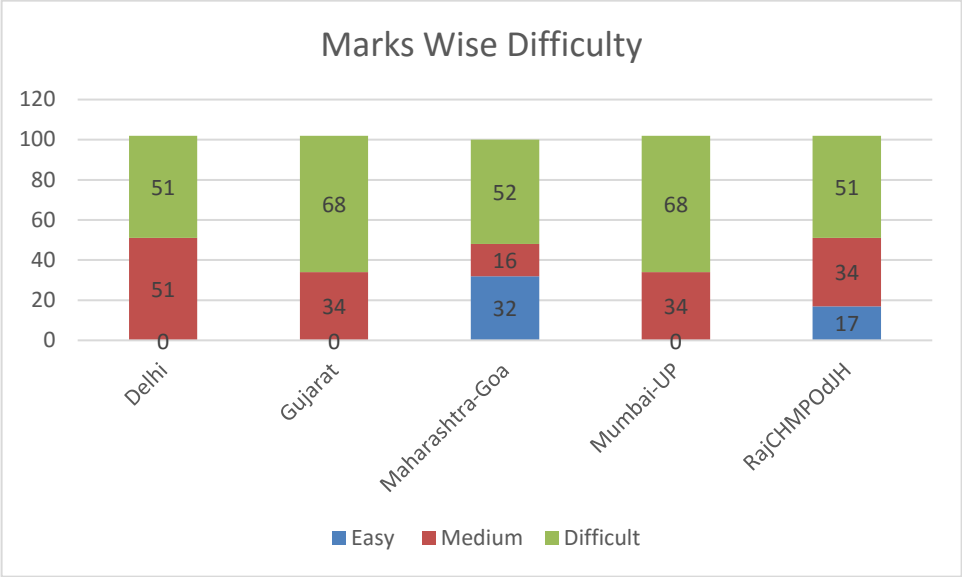
Difficulty Level Analysis: No of Questions

	Easy		Medium		Difficult		Total	
Region	Count	Marks	Count	Marks	Count	Marks	Count	Marks
Delhi			3	51	3	51	6	102
Gujarat			2	34	4	68	6	102
Maharashtra-Goa	2	32	1	16	3	52	6	100
Mumbai-UP			2	34	4	68	6	102
Rajasthan, Chattishgarh, Madhya Pradesh, Odisha and Jharkhand	1	17	2	34	3	51	6	102

Resonance Experts feel that papers across were of similar difficulty level, while paper at Maharasthra and Goa was on easier side compared with Rajasthan, Chattisgarh, Madhya Pradesh, Odisha and Jharkhand, papers at Mumbai and Gujarat region were the toughest.

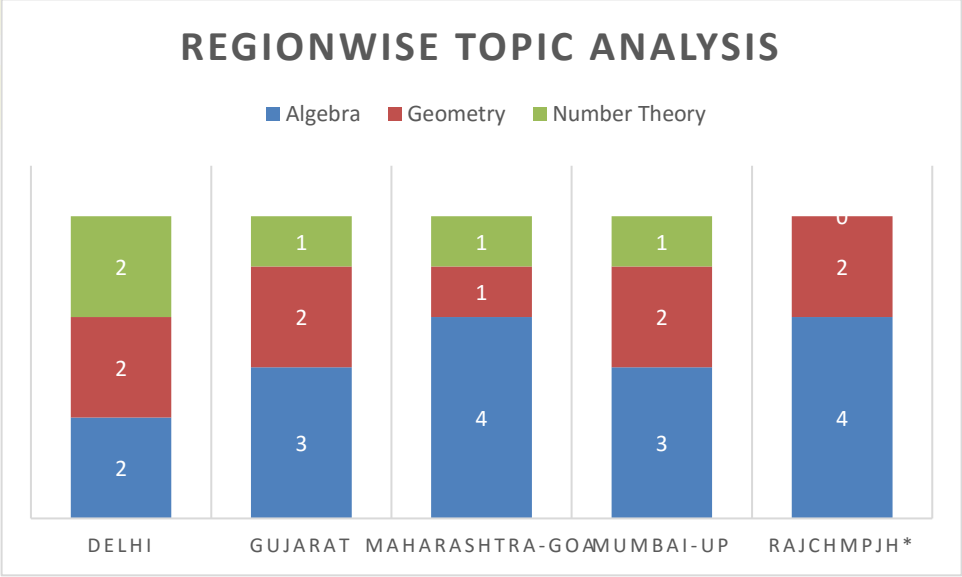
Overall, it is felt by Resonance Faculty Team that paper was on tougher side compared to last year and the cut-off is expected to be lower than that of last year.

Marks Wise Difficulty Breakup



TOPIC WISE ANALYSIS

a) Topic Wise Graph



* Rajasthan, Madhya Pradesh, Jharkhand, Odisha and Chattisgarh

Region	Total Questions	Total Marks
Delhi	**6**	**102**
Algebra	2	34
Inequalities	1	17
Permutation and Combination	1	17
Geometry	2	34
Circle	2	34
Number Theory	2	34
Real Analysis	1	17
Squares	1	17
Gujarat	**6**	**102**
Algebra	3	51
Inequalities	1	17
Permutation and Combination	1	17
Sequence and Series	1	17
Geometry	2	34
Triangles	2	34
Number Theory	1	17
Properties of Numbers	1	17
Maharashtra-Goa	**6**	**100**
Algebra	4	68
Inequalities	1	16
Permutation and Combination	2	36
Theory of Equations	1	16
Geometry	1	16
Triangles	1	16
Number Theory	1	16
Factors and Multiples	1	16
Mumbai-UP	**6**	**102**
Algebra	3	51
Inequalities	1	17
Permutation and Combination	1	17
Sequence and Series	1	17
Geometry	2	34
Triangles	2	34
Number Theory	1	17
Properties of Numbers	1	17
Rajasthan, Chattisgarh, Madhya Pradesh, Odisha and Jharkhand	**6**	**102**

Algebra	4	68
Inequalities	2	34
Permutation and Combination	1	17
Sequance and Series	1	17
Geometry	2	34
Triangles	2	34

EXPECTED CUTOFF

Regional coordinators for RMO typically just show the list of students qualified to appear for INMO. Thus, details of cutoff is not available accurately.