

From :

Zonal Coordinator, INMO

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To :

THE PRINCIPAL / HEAD MASTER / HEAD MISTRESS / H.O.D., MATHEMATICS

Dear Sir,

We have the pleasure in informing you that the students appeared in PRMO and have successfully qualified for the Regional Mathematical Olympiad (RMO) Test will be held on 20th October, 2019 from 1 p.m to 4 p.m in different centres of the state. We expect your sincere cooperation and active support for smooth conduct of RMO-2019. This test is conducted annually with a view to spot and nurture mathematical talent among school and pre-college students to participate in the International Mathematical Olympiad.

Along with this examination, there shall be a test of mathematical ability amongst the students of Classes VI, VII and VIII of the schools of Odisha, named as Junior Mathematical Olympiad (JMO) and Senior Mathematical Olympiad (SMO) for the under graduate students of Mathematics.

It goes without saying that such an undertaking will never succeed without your sincere and enthusiastic cooperation. We have no doubt that you will take all possible steps to give this test adequate publicity and motivate large number of students of your institution to participate in it.

We shall feel obliged if you would kindly send the consolidated list of applicants in duplicate in the prescribed proforma along with the fees as suggested under the heading **How to Apply** at pp.6-7.

With regards.

Your sincerely,

(Zonal Coordinator, INMO)

N.B. : If your institution is a Centre, we further request you or your nominee to kindly act as the Centre Superintendent for the above examinations. The details of the Centre expenses and conduct of examinations are given in the next page.

INFORMATION BROCHURE

For

Regional Mathematical Olympiad (RMO)
which is the only recognised Olympiad
Leading to participation in

Indian National Mathematical Olympiad (INMO)

And International Mathematical Olympiad (IMO)

conducted by Homi Bhabha Centre for Science Education (HBCSE)
on behalf of National Board for Higher Mathematics (NBHM), A Unit of
Atomic Energy Department, Government of India

&

**Junior Mathematical Olympiad (JMO) &
Senior Mathematical Olympiad (SMO) in the State of Odisha**

Conducted by :

ODISHA MATHEMATICAL SOCIETY (OMS)

Head Quarter At - P.G. Department of Mathematics,
Utkal University, Vani Vihar, Bhubaneswar - 751004

REGIONAL MATHEMATICAL OLYMPIAD (RMO) - 2019

JUNIOR MATHEMATICAL OLYMPIAD (JMO) - 2019

SENIOR MATHEMATICAL OLYMPIAD (SMO) - 2019

Date of Examination :

20.10.2019 (Sunday) (1 p.m. to 4 p.m.) : RMO

12.01.2020 (Sunday) (1 p.m. to 4 p.m.) : JMO & SMO

Last date of Application for JMO & SMO : 20.12.2019

E-mail - h.pattnayak@gmail.com
Related Web Sites - www.hbcse.tifr.res.in / olympiads,
http://olympiads.hbcse.tifr.res.in
www.omsonnet.com
www.iomaorissa.ac.in

A.	(1) Centre Superintendent	Rs. 500.00
	(2) Deputy Centre Superintendent (where the number of candidates exceeds 250)	Rs. 400.00
	(3) Invigilator (One for every 40 candidates and part thereof. No reliever is to be appointed.)	Rs. 300.00
	(4) Packer-cum-water boy	Rs. 100.00
	(5) Clerical assistance	Rs. 150.00
	(6) Contingency	Rs. 100.00
	(7) Sitting arrangements and sweeping	Rs. 10.00

for every 10 candidates or part thereof

- B. A representative of the Zonal Coordinator will carry to you the sealed question packet and answer scripts. You are requested to hand over to him the sealed packet of the used answer scripts after examination. He will also carry back unused questions and answer scripts to the Zonal Coordinator.
- C. The same representative will make the payment on the spot and obtain the vouchers.
- D. Centre Superintendents may permit the candidates (who have not applied but turned up at the last moment) after they satisfy themselves that the candidates are genuine students of some institutions. In that case you may send their names, roll numbers and the money through the representatives.
- E. **A School / College with at least 120 applicants can be a centre in addition to the usual centres previously fixed at the District Headquarter Govt. Colleges. For this purpose contact the Zonal Coordinator (INMO) of the respective zones. Zonal coordinators will consult with the Regional Coordinator before declaring any new centre.**

Important Information

1. The School/College Roll No. of the candidate shall be the candidate's Roll No. for Olympiad examination.
2. The candidates should carry an Identity card / a Letter of Identification from Head of the Institution to the Centre of Examination.
3. The Centre Superintendents shall admit the students on the basis of such Identity cards.
4. NO ADMIT CARD SHALL BE SENT FROM THE ZONAL COORDINATOR.

Thanking you for your kind cooperation.

(Zonal Coordinator, INMO)

Objective

The Indian National Mathematical Olympiad (INMO) is one of the major initiatives undertaken by the National Board for Higher Mathematics (NBHM), a unit of the Department of Atomic Energy, Govt. of India to spot and nurture mathematical talent among young students who can participate in the International Mathematical Olympiad (IMO). Every year the test is organized by Homi Bhabha Centre for Science Education (HBCSE) on behalf of NBHM, which leads to participation of Indian students in the IMO.

For the purpose of training and selection of students for the Olympiad contest 25 regions all over the country have been identified and each region is assigned a Regional Co-ordinator; Odisha is one of such regions. The Odisha Mathematical Society (OMS) conducts the Regional Mathematical Olympiad (RMO) every year to select and train 35 selected students (30 in order of merit and 5 girls) who can take part in the INMO. In order to encourage the students and to imbibe mathematical interest at an early age, we also conduct another examination viz. Junior Mathematical Olympiad (JMO) along with RMO. To test the mathematical ability of the under graduate students having mathematics as a core subject, a Senior Mathematical Olympiad (SMO) examination is also organized along with RMO and JMO, on the same day.

Regional Mathematical Olympiad (RMO)

From the year 2017 four steps are suggested by NBHM for participating in IMO qualifying RMO. First step is Pre-RMO which has been organised on 11.08.2019 by IAPT and MTA on behalf of HBCSE. The selected candidates of PRMO (Class VI to Class XII) will appear RMO the 2nd step on 06.10.2019 after qualifying RMO one will appear at the INMO Examination to be held on the 3rd Sunday of January, 2020.

For smooth conduct of RMO, JMO and SMO, the Odisha state has been divided in to six zones : Utkal University Zone-I and Zone-II, Berhampur Zone-I and Zone-II and Sambalpur Zone-I and Zone-II. Each zone is headed by a Zonal Co-ordinator appointed by the Regional Co-ordinator, in consultation with the President of OMS. Each district is having a district Co-ordinator to help the Zonal Co-ordinator.

Eligibility

RMO – Students of Class VIII, IX, X, XI and XII are eligible to appear at Pre-RMO & RMO test who are born after 1st August, 1998.

JMO – Students of Class VI, VII and VIII are eligible to appear at JMO test.

SMO – 2nd and 3rd year students of

- (i) B.A / B.Sc with pass or honours in Mathematics.
- (ii) B.Sc of NISER with Mathematics as a core subject.
- (iii) B-Tech of IIT, NIT and other Engineering Colleges/Technical Universities of the State of Odisha.

Syllabus

JMO – Sound knowledge of mathematics in middle schools. The areas covered are Arithmetic, Geometry, Algebra, Number Theory.

RMO – 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 combinations, Factorization of Polynomials, Inequalities, Elementary Combinatorics, Probability Theory and Number Theory, Finite Series and Complex Number and Elementary Graph Theory. The syllabus does not include calculus and statistics. The major areas from which problems are given are Number Theory, Geometry, Algebra and Combinatorics. The syllabus is in a sense spread over from Class X to XII level. The questions will not be of routine type. The test questions would be of a nature requiring insight, critical approach, logical thinking, the power of application of knowledge in solving problems. The difficulty level increases from RMO to INMO to IMO. In RMO students have to answer six questions.

SMO – Thought Provoking Problems from Analysis (Real and Complex), Advanced Calculus, Algebra (Abstract and linear), Probability Theory, Differential Equations, Number Theory, Geometry of Three Dimentions, Mechanics and Numerical Analysis.

N.B. : Students appearing at RMO Examination can get question papers with answers of the past 15 years and other information from the web sites [www.hbcse.tifr.res.in / olympiads](http://www.hbcse.tifr.res.in/olympiads), [http://olympiads.hbcse.tifr.res.in / subjects / mathematics / previous question papers and solutions](http://olympiads.hbcse.tifr.res.in/subjects/mathematics/previous-question-papers-and-solutions) and the books no. 1, 2, 3, 4, 5, 6 (a) & (b) in the reference. The following books may be referred for preparation.

Books for References

1. Problem primer for Olympiads - C.R. Pranesachar, B;J. Venkatachala and C.S. Yogananda.
2. Challenge and Thrill of Pre-College Mathematics - V. Krishnamurthy, C.R. Pranesachar, K.N Ranganathan and B.J. Venkatachala - New Age International Publication.
3. An Excursion in Mathematics - Editor : M.R. Modak, S.A. Katre and V.V. Acharya (Bhaskaracharya Pratisthana, Pune)
4. Problem Solving Strategies : Arther Engel (Springer Verlag, Germany)
5. Functional Equations : B;J. Venkatachala (Prism Books Pvt. Ltd. Bangalore)
6. (a) Mathematical Circles : Fomin and others, University Press, Hyderabad.
(b) Inequalities an approach through problems by B J Venkatachala (Hindustan Book Agency)
7. Problem Solving through Problems : Larson
8. How to Solve Olympiad Problems : G. Polya
9. (a) ଗଣିତ ଅଲିମ୍ପିଆଡ଼ : ଏକ ପରିକ୍ରମା (1986-1999) published by Sathi Prakashan, Banka Bazar, Cuttack-2
(b) ଅଭିନବ ଗଣିତ ବିଚିତ୍ରା (Quarterly Journal) published by Orissa Mathematical Society
(c) 1. Mathematical Olympiad Problems Book I to VI.
2. NYSML American Mathematical Contests.
3. International Mathematical Olympiads (1959-79) and (1978-85).
4. USA Mathematical Olympiads.

The books listed in (c) above are available at Mathematical Science Trust Society, C-766, New Friends Colony, New Delhi - 110 065.

- (d) Mathematics Olympiad : A Problem Set, by U. Patel and S.K. Sahoo
- (e) ଗଣିତ ଅଲିମ୍ପିଆଡ଼ ପ୍ରବେଶ (କୁନିୟର ଓ ଆଞ୍ଚଳିକ ଗଣିତ ଅଲିମ୍ପିଆଡ଼ ନିମନ୍ତେ)
- (f) A Prelude to Math Olympiad published by Sathi Prakashan, Banka Bazar, Cuttack-2
- (g) କୁନିୟର ଗଣିତ ଅଲିମ୍ପିଆଡ଼ published by Sathi Prakashan, Banka Bazar, Cuttack-2
- (h) Mathematics Olympiad Problem Book for Primary & Middle School (useful for Primary and JMO)
- (i) ଗଣିତ ସାମ୍ରାଜିକ JMO - Chandra Kisore Mohapatra, Book Point, Pathani Samanta Planetorium, BBSR.
- (j) ଅବସର ବିନୋଦିନୀ JMO - Chandra Kisore Mohapatra, Book Point, Pathani Samanta Planetorium, BBSR.
- (k) ତିନୋଟି ଗାଣିତିକ ପଞ୍ଜତି JMO - Chandra Kisore Mohapatra, Book Point, Pathani Samanta Planetorium, Bhubaneswar.
- (l) Olympiad Mathematics RMO and JMO - Chandra Kisore Mohapatra, K.C. Satpathy & Jyostna Dash, Book Point, Pathani Samanta Planetorium, Bhubaneswar.
- (m) Go Ahead with Mathematics by Madan Mohanty.

Awards and Certificates

Gold and Silver medals will be awarded to RMO candidates who secure the top two positions at the Regional level. Merit Certificates will be awarded to all the candidates who come upto the level expected by the evaluation board. Those who will qualify in INMO, at the National Level, will get Gold Medals. Two Silver Medals are awarded to the Class-IX students one medal to the student who secures highest mark in RMO and another medal to the girl student of Odia medium school securing the highest mark in RMO.

The top three students in RMO will get cash award of Rs. 3000, 2000 and 1000 respectively. The top three students of SMO will get a cash award of Rs. 2000/-, 1500 & 1000 respectively. Merit certificate will be given to the top 5 percent of the total participants.

Selection Procedure for INMO

After the RMO examination answer scripts will be evaluated at different zonal centres according to the scheme of valuation. First 80 papers chosen on the basis of marks shall be rechecked by the experts to select the 35 (30 + 5 girls) candidates to appear at the INMO test. This test will be held at the Office of the Regional Co-ordinator, PG Department of Mathematics, Utkal University, Vanivihar, Bhubaneswar-751004 on the Third Sunday of January, 2018 (21st January between 12.00 noon to 4.00 p.m.). A short term training programme for the students selected for INMO test will be organized by Institute of Mathematics and Applications. Assessment and re-valuation of RMO paper: The re-valuation process shall be declared on the website www.omsonnet.com and anybody interested for re-valuation shall apply within 7 days after getting the individual mark and the candidate has to deposit Rs. 500/- by draft in favour of Zonal Co-ordinator of respective zones. The final result of RMO of all regions shall reach the HBCSE by 30th November, 2017 and the result of RMO shall be declared centrally by HBCSE on 6.12.2017. The INMO result will be declared in the last week of February.

INMO SCHOLARSHIP : The INMO awardees who pursue B.Sc. or other courses related to mathematics as principal subject are eligible to receive a scholarship of Rs. 4,000 per month through the period of their UG studies by NBHM & an enhanced scholarship would be available for pursuing masters studies in mathematics.

The selected candidates of INMO shall be eligible for appearing Asia Pacific Mathematics Olympiad (APMO) and the selected girl students will be eligible for appearing European Girls Mathematics Olympiad (EGMO).

Selection procedure and Award of Medals for JMO

JMO papers will be centrally evaluated at specified zonal centres and best 200 papers will be re-evaluated centrally at the level of Regional Co-ordinator to select 100 students on merit basis so that the merit list includes atleast 5 students from each zone. A summer training camp for the 100 selected students will be conducted by the Institute of Mathematics & Applications at Bhubaneswar during May - June every year. During the training camp another examination will be conducted to select the students for the award of medals. The Gold & Silver Medals will be awarded on the basis of the performance at this test and the preceding JMO test. The topper will be awarded a Gold Medal and cash prize of Rs. 2000/- instituted by Dr. Hadibandhu Pattanayak in memory of his father Late Kampal Pattanayak and the 2nd and 3rd position holders will get silver medals with cash prize of Rs. 1500 and 1000 respectively. Result of RMO, SMO and JMO shall be available in the website www.omsonnet.com & iomaorissa.ac.in

N.B. : All participants of RMO, SMO & JMO securing more than 30 % marks shall get Merit Certificate.

At the zonal level all students appearing at JMO shall be given participation certificate by the Zonal Co-ordinator.

How to Apply

1. The candidates of urban and semi urban areas who desire to appear in JMO & SMO Exam. shall deposit Rs. 100/- and the rural Odia Medium School students shall deposit Rs. 50/- with the Headmaster / Headmistress / Principal / Head of the Department of his / her institution. However a maximum 5% of the extremely poor meritorious candidates of BPL category shall be exempted from the enrollment fee. A declaration certificate to this effect shall be submitted by the Head of the Institution.
2. The Headmaster / Headmistress / Principal / Head of the Department shall prepare a consolidated list of the candidates in the following proforma and send it, along with the fees collected, to the Zonal Co-Ordinator, INMO of the respective Zones.

PROFORMA

- (i) Name of the Institution with complete address :
with Phone No. and E-mail ID of the Institution
or of the Head of the Institution
- (ii) Total No. of applicants :
- (iii) Amount of fees collected :
- (iv) Mode of payment :
- (v) List of applicants : (a) Please write (W) against the name in case the candidate is a girl.

Sl. No.	Full Name of the candidate	Residential address	Class	School/College Roll No.	Centre of choice	Test to appear RMO/JMO/SMO
1	2	3	4	5	6	7

Full Signature of the Head of the Institution/H.O.D. Math, with Official Seal

3. The fees collected shall be deposited in one of the following modes :

(i) By cash, (ii) By Money order or (iii) By account payee crossed bank draft in favour of the Zonal Co-ordinator, INMO drawn on the bank mentioned below against the name of the Zonal Co-ordinator.

Sl. No.	Name of Zonal Coordinator	Zone	Bank
1	Dr. Tusarkanti Tripathy	Utkal University Zone - I Nayagarh, Puri, Cuttack, Khurda districts	SBI, Utkal University Campus.
2	Dr. Bibekananda Jena	Utkal University Zone - II Jajpur, Kendrapara, Jagatsinghpur, Balasore, Bhadrak, Keonjhar, Mayurbhanj, Dhenkanal districts	SBI, Utkal University Campus.
3	Dr. Sisir Kumar Sahoo	Sambalpur Zone I Sambalpur, Debagarh, Sundargarh, Jharsuguda, Angul districts	UCO Bank, G.M. College, Sambalpur.
4	Sri Radhegopal Khamari	Sambalpur Zone II Baragarh, Bolangir, Kalahandi, Nuapada, Boudh, Subarnapur dist.	UCO Bank, G.M. College, Sambalpur.
5	Dr. P. N. Samanta	Berhampur Zone - I Ganjam, Kandhamal, Gajapati districts	SBI, Bhanja Vihar, Berhampur.
6	Dr. Antaryami Rath	Berhampur Zone - II Koraput, Nawarangpur, Malkanagiri, Rayagada districts	SBI, Jeypore.

Explanation : If a candidate X deposits fees with Headmaster/Principal/Head of the Department of the institution Y, and Y falls in the Zone Z, then the consolidated list and fees should be deposited with the Zonal Co-Ordinator of Z. In case fees are deposited by bank draft, it shall be in favour of Zonal Co-Ordinator, INMO, Z - Zone drawn on bank B, specified against the name of the Zonal Co-Ordinator, INMO of Z - Zone **but not by name.**

Contact Addresses

Regional Coordinator

Dr. Hadibandhu Pattanayak - A2, Rashmi Tower, Nageswar Tangi, Bhubaneswar-2,
Ph. : 9337124910, 0674-2431959

Zonal Coordinators

- Dr. Tusarkanti Tripathy - Dept. of Mathematics, BJB Auto. College, Ph. - 9437161736
 Dr. Bibekananda Jena - Department of Mathematics, V.N College, Jajpur Road, Ph. - 9437276721
 Dr. Sisir Kumar Sahoo - Ex-Registrar, IMA, Patrapada, Sundargarh-770001, Ph - 9861073663
 Sri Radhegopal Khamari - Head of Dept. of Mathematics, Panchayat College, Baragarh,
Ph. - 9777009219
 Dr. P. N. Samanta - Dept. of Mathematics, Berhampur University, Bhanja Vihar,
Berhampur, Ganjam, Ph. - 9090512992
 Dr. Antaryami Rath - Dept. of Mathematics, V.Dev College, Jeypure, Ph. - 9437097447.

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From :

Zonal Coordinator, INMO