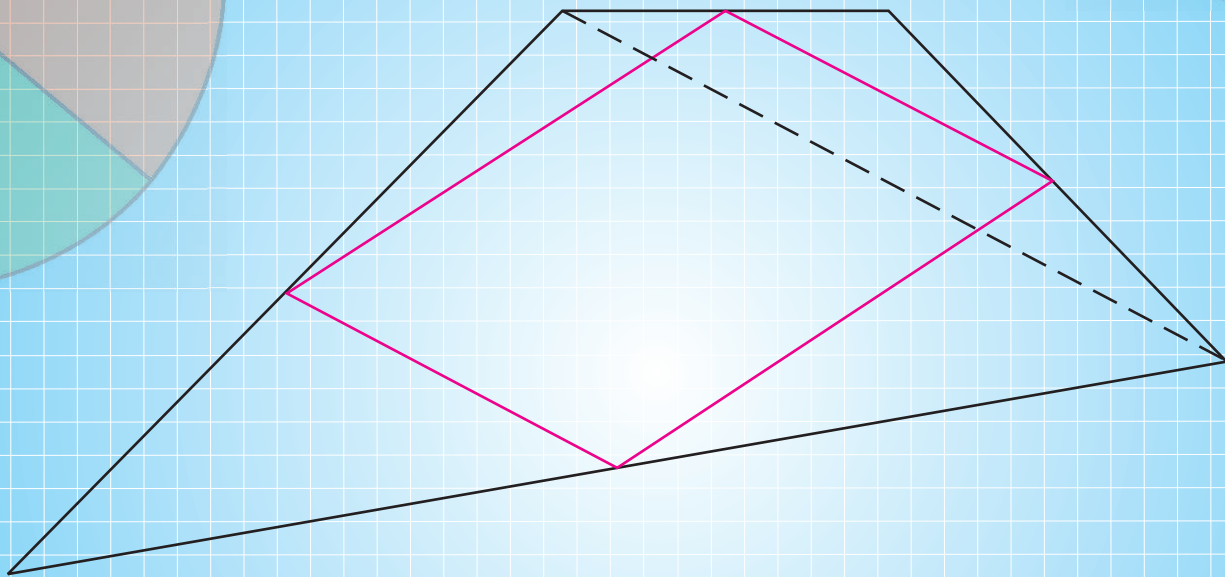


A Study Report

PERFORMANCE ANALYSIS OF STUDENTS IN MATHEMATICS

Class X



CENTRAL BOARD OF SECONDARY EDUCATION

Preet Vihar, Delhi – 110092

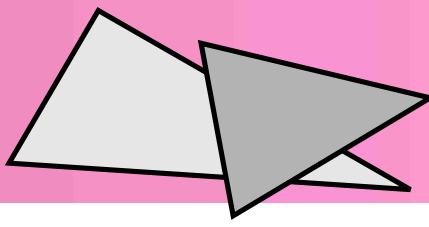
Performance Analysis of Students in Mathematics

Class X

A Study Report



Central Board of Secondary Education
Preet Vihar, Delhi – 110092.



Performance Analysis of Students in Mathematics

Class X

A Study Report

CBSE, Delhi-110092

March, 2009 : 25000 Copies

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Published by :

The Secretary, C.B.S.E. 'Shiksha Kendra', 2, Community Centre,
Preet Vihar, Delhi - 110092.

Printed by :

Vijayalakshmi Printing Works (P) Limited

B-117, Sector-5, Noida,-201301, Ph.: 0120-2421763, 2421977



Foreword

Conceptual understanding in the subject of Mathematics is highly desirable and the components of spatial understanding and logical reasoning lay the foundation in a student for developing his analytical skills, to co-relate and apply.

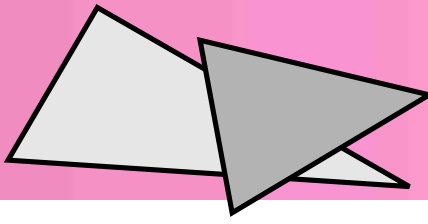
The examination not only serves the purpose of certification but also can be a useful tool to improve the academic achievement of students as well as instructional strategies adopted by the teachers. A critical analysis of students' responses to different questions asked in the examination provides valuable feedback about exact areas of weaknesses in learning as well as shortcomings in curriculum transactions. It helps in identifying the areas which deserve greater attention both on the part of teachers as well as students.

The present study pertains to the analysis of students' responses to the different questions asked in Mathematics paper of class X CBSE Board examination 2008 and comprises of quantitative as well as 'qualitative analysis of students' responses, drawing samples from Delhi region as well as from outside Delhi regions. The study is aimed at highlighting the errors generally committed by majority of students and suggesting some remedial measures for their prevention. It also identifies some of the hard spots of learning which needs greater attention by students as well as teachers. It is hoped that teachers will go through the report and put it to the best of use in improving classroom instructional strategies.

I express my sincere thanks to the experts who conducted this study and brought out the report. I also acknowledge the contribution of Mrs. C. Gurumurthy, Director (Academic), CBSE and Dr. Srijata Das, Education Officer in successful completion of this study and publication of this document.

Suggestions from users for further improvement of study will be highly appreciated.

Vineet Joshi
(Chairman)



भारत का संविधान उद्देशिका

हम, भारत के लोग, भारत को एक **संपूर्ण प्रभुत्व-संपन्न, समाजवादी, पंथ-निरपेक्ष, लोकतंत्रात्मक गणराज्य** बनाने के लिए तथा उसके समस्त नागरिकों को:
सामाजिक, आर्थिक और राजनैतिक **न्याय**,
विचार, अभिव्यक्ति, विश्वास, धर्म और उपासना की **स्वतंत्रता**,
प्रतिष्ठा और अवसर की **समता** प्राप्त कराने के लिए,
तथा उन **सबमें** व्यक्ति की गरिमा और **राष्ट्र की एकता और अखंडता सुनिश्चित** करने वाली बंधुता बढ़ाने के लिए
दृढसंकल्प होकर **अपनी इस संविधान सभा में** आज तारीख 26 नवंबर, 1949 ई. (मिति मार्गशीर्ष शुक्ला
सप्तमी, संवत् दो हजार छह विक्रमी) को **एतद्वारा इस संविधान को अंगीकृत, अधिनियमित और आत्मार्पित**
करते हैं।

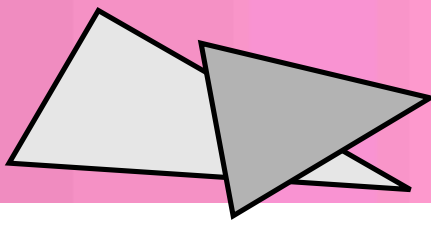
भारत का संविधान भाग 4क नागरिकों के मूल कर्तव्य

अनुच्छेद 51क

मूल कर्तव्य— भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि वह –

- (क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्रध्वजों और राष्ट्रगान का आदर करे;
- (ख) स्वतंत्रता के लिए हमारे राष्ट्रीय आंदोलन को प्रेरित करने वाले उच्च आदर्शों को हृदय में संजोए रखे और उनका पालन करे;
- (ग) भारत की संप्रभुता, एकता और अखंडता की रक्षा करे और उसे अक्षुण्ण बनाए रखे;
- (घ) देश की रक्षा करे और आह्वान किए जाने पर राष्ट्र की सेवा करे;
- (ङ.) भारत के सभी लोगों में समरसता और समान भ्रातृत्व की भावना का निर्माण करे जो धर्म, भाषा और प्रदेश या वर्ग पर आधारित सभी भेदभाव से परे हो, ऐसी प्रथाओं का त्याग करे जो महिलाओं के सम्मान के विरुद्ध हों;
- (च) हमारी सामासिक संस्कृति की गौरवशाली परंपरा का महत्व समझे और उसका परिरक्षण करे;
- (छ) प्राकृतिक पर्यावरण की, जिसके अंतर्गत वन, झील, नदी और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करे तथा प्राणिमात्र के प्रति दयाभाव रखे;
- (ज) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करे;
- (झ) सार्वजनिक संपत्ति को सुरक्षित रखे और हिंसा से दूर रहे;
- (ञ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत प्रयास करे, जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई ऊँचाइयों को छू सके; और
- (ट) यदि माता-पिता या संरक्षक है, छह वर्ष से चौदह वर्ष तक की आयु वाले अपने, यथास्थिति, बालक या प्रतिपाल्य को शिक्षा के अवसर प्रदान करे।





Acknowledgements

CBSE Advisors

Sh. Vineet Joshi, Chairman, CBSE, Delhi

Smt. C. Gurumurthy, Director, Academic.

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1. *Prof. S.K.S. Gautam,*

2. *Shri I.C. Ahuja*

3. *Shri J.C. Nijhawan*

4. *Shri D.R. Sharma*

5. *Shri B.M. Gupta*

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7. *Ms. Aarti*

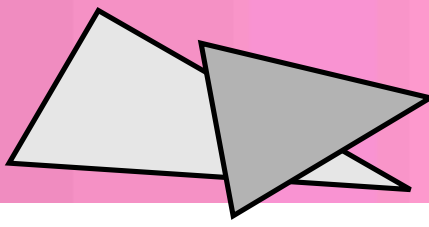
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Education officer, CBSE, Delhi*



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Introduction

The role of Central Board of Secondary Education is gradually evolving from merely an examining body to an academic institution with increasing interventions in improving the teaching/learning process in school education. Analysis of students' performance in examination helps not only in identifying the errors commonly committed by majority of students but it also helps in the diagnosis of hard spots of learning in the subject. This diagnosis can serve as a powerful tool for improving students academic achievements in the overall teaching process.

The present study in Mathematics has been undertaken by CBSE for candidates who appeared in class X, 2008 Board examination. It includes the analysis of performance of students of both Delhi region as well as outside Delhi region.

Objectives of the Study

The Objectives of the study are :

- (i) Identifying errors commonly committed by majority of students vis-a-vis correct responses given in the marking scheme.*
- (ii) Identifying hard spots of learning in different topics.*
- (iii) Suggesting remedial measures to be taken up by the teachers to improve instructional strategies and students understanding of the subject.*

Procedure

The performance of a student may be affected by a number of variables such as, quality of learning experiences, availability of resources, type of school, type of location of school, type of question etc. But the overall achievement in the subject is judged by the aggregate marks obtained by the students.

The procedure for selection of answer scripts to be analysed and the selection of tools has been as follows :

(a) Selection of Answer Scripts

The study included the analysis of performance of students' responses of Delhi region as well as outside Delhi region. It was decided to analyse 100 answer scripts



from each of the regions, Delhi, Panchkula, Ajmer, Allahabad and Chennai. Stratified random sampling techniques have been adopted for selection of answer scripts so that the answer scripts were independent of any particular variable. For matter of uniformity, the answer scripts pertaining to only the first question paper from each of the category (Delhi and outside Delhi) have been selected.

The 100 answer scripts from each of the regions have been selected as per the following criteria :

Category	Range of Marks	No. of Answer Scripts
I	0-27	25
II	28-40	25
III	41-60	25
IV	61-80	25

(b) Question Paper Used

For Delhi region, the mathematics Question paper 30/1/1 has been used and for outside Delhi region, the question paper 30/1 of 2008 Board examination has been used.

(c) Tool Used

The data has been analysed both quantitatively and qualitatively. In the quantitative analysis, mean percentage has been used to highlight the result, whereas the qualitative analysis has been done through analysis of errors and giving their remedial measures.

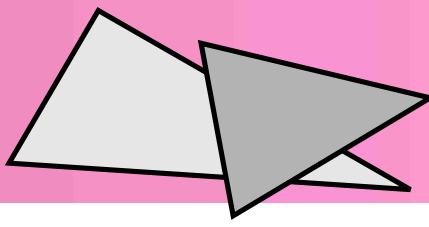
To concise the data for making pie charts the following categories of marks have been combined.

In Q. No. 11 to 15

$1\frac{1}{2}$ and 2 marks are represented by 'almost correct'

$\frac{1}{2}$ and 1 mark are represented by 'some error'

Not attempted or 0 marks are represented by 'unable to attempt'



In Q. No. 16 to 25

2½ and 3 marks are represented by ‘almost correct’

1½ and 2 marks are represented by ‘minor errors’

½ and 1 marks are represented by ‘major errors’

Not attempted and 0 marks are represented by ‘unable to attempt’

In Q. No. 26-30

5 to 6 marks are represented by ‘almost correct’

3 to 4½ marks are represented by ‘minor errors’

½ to 2½ marks are represented by ‘major errors’

Not attempted and 0 marks are represented by ‘unable to attempt’

Selection of Working Group

The working group for the study comprised of competent and senior classroom teachers, teacher educators, examiners of the Board answer scripts, experts from NCERT, subject specialists from Delhi University who have wide experience in teaching students, checking the Board papers and doing research. Detailed discussions were held amongst the members of the group to analyse the performance of the students, and finalising their observations & findings.