Gujarat State Board Examination Reform

Project C, Part B

A 5-year transition plan (from an administrative and advocacy point of view) to change exam format to significantly shift to learning with understanding.
Acknowledgement

This report would not have been possible without the help of a large number of people.

We would like to express our gratitude to one and all who have helped to successfully execute this study.

We would like to express our deep gratitude to the team from Gujarat Secondary and Higher Secondary Education Board and Michael and Susan Dell Foundation, for their support and guidance in the project.

Last, but not the least, we would like to acknowledge all the researchers and education boards across the world whom we have studied and referred to in our endeavour to bring about the present report.

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# TABLE OF CONTENTS

1. EXECUTIVE SUMMARY 5

2. INTRODUCTION 7  
   2.1 The Need 7  
   2.2 The Problems and the Challenges 7

3. METHODOLOGY AND CURRENT PROCESSES 11  
   3.1 Research Methodology 11  
   3.2 Current Gujarat Board Examination Processes 12

4. CHANGES RECOMMENDED AND OVERALL APPROACH 14  
   4.1 Transition Plan Structures 14

5. TRANSITION PLAN ON TEST PAPER FORMAT AND STUDENT SUPPORT 16  
   5.1 Transition Plan 5 Year Road Map 16  
   5.2 Concerns about Students’ Overall Performance Drop 17  
   5.3 Multipronged Support for Students and Teachers 17

6. CAPACITY BUILDING 20  
   6.1 Designing Courses 21  
   6.2 Creating a Bank of Video Materials and Courses in Gujarati 22  
   6.3 Creating a Bank of Quality Material in Gujarati 24  
   6.4 Organising Competitions and Exchange Programmes for Teachers 24  
   6.5 Rolling out training – Both Face to Face and ICT

7. RECOMMENDED CHANGES AT BOARD LEVELS 26  
   7.1 Changes in the Board 26

8. ADVOCACY MEASURES 30  
   8.1 A detailed advocacy plan 30

BIBLIOGRAPHY 31

APPENDICES 33  
   I. Discussions with Stakeholders : Students and Parents 33  
   II. Discussions with Stakeholders : Teachers, Principals and Board Officials 34  
   III. Time Line for Transition 47  
   IV. A Sample of Assessment Rubrics 50  
   V. Some Examinations Boards and Assessment Institutes Internationally 58
The Need: Whether from the point of view of examination stress, low student learning levels reported by tests like PISA, or the question of employability of the students who fail (or some who even pass) the Class 10 Board Exams, there seems to be a clear call for reform. This is the second part of a study examining how these exams should be reformed in Gujarat. Part 1 compared school leaving exam papers from a number of countries and concluded that our papers focus too much on rote memorisation and recall. This part proposes changes in exam processes and questioning patterns and presents a 5 year transition plan towards change. Later parts will provide specific samples papers and detailed analysis of recommended teaching processes and courses to action the changes.

Problems and Challenges: The process of reform is made difficult by a number of factors. One is that the Board Exams are a high-stake, multi-stakeholder process. Any change affects students, parents and teachers in such large numbers that the media, government society as a whole is affected. Secondly perceptions vary – students and parents abhor ‘out of syllabus’ questions – a euphemism for a question which may differ from one in the textbook. Successful countries seem to have a majority of such questions which require students to think beyond the text. And thirdly, capacity issues across the system will need to be addressed effectively.

Discussion: As part of this project we spoke to a large number of students, parents, teachers, principals, educationists and Board officials and studied researches. We heard diverse views and many suggestions. One common view was that before Exam Reforms, teaching must be reformed. Another view – and one we agree with – was that the best way to encourage those reforms in teaching processes was to change exam questioning patterns while simultaneously providing strong training and support to teachers.

Board officials were concerned about paper leakages, errors and copying – and felt, for example that a bank of carefully check multiple choice questions would solve many problems. Educationists – as well as the experience of other countries – suggested the need for diverse types of questions including those in which students have to express themselves effectively and which should be unpredictable and unique forcing them to think!

### Sample Maths Questions from Gujarat

<table>
<thead>
<tr>
<th>Sample Maths Questions from Gujarat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find the nth term of an Arithmetic Progression 3, 8, 13, 18.....</td>
</tr>
<tr>
<td>The formulae to find the total surface area of a closed cylinder are......</td>
</tr>
<tr>
<td>Find the simple interest of Rs. 8000 at 10% for 3 years</td>
</tr>
</tbody>
</table>

### Sample Maths questions from Hong Kong (similar questions are also found in other international Boards)

<table>
<thead>
<tr>
<th>Sample Maths questions from Hong Kong (similar questions are also found in other international Boards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The seats in a theatre are numbered in numerical order from the first row to the last row, from left to right as should in Figure 7. The front row has 12 seats. Each succeeding row has 3 more seats than the previous one. If the theatre cannot accommodate more than 930 seats, what is the greatest number of rows of seats in the theatre?</td>
</tr>
</tbody>
</table>

### Fig. 1: We emphasise so much on only textbook-based and procedural questions (all the examples of the left) that our children struggle with questions that they may be in an unfamiliar form. The question on the right represents a real-life application of Arithmetic Progressions. Can we introduce many such questions in the Gujarat Board 10 paper - today there are almost none?
Recommendations: These recommendations have been designed keeping the above in mind to ensure the maximum likelihood of success. While all the recommendations are important, we would specially emphasise that point 3 as being central to the success of this initiative.

1. Clear structures in the Board to own and facilitate change
   We recommend the Board Exam change process is guided by an Advisory Council which oversees the entire multi-year process. The process should be housed in a Transition Cell the board. A multi-year Technical Support Programme is also recommended to help action the changes.

2. A clear roadmap of initially very gradual change in the questioning pattern in the Board Exams with strong student support mechanisms.
   A 5-year transition plan have been described to increase the percentage of understanding-based questions in the class 10 Board papers from the current levels of almost 0% to about 65% which is in line with the best school-leaving exams in the world. The impact in the first 3 years has been kept very low.

<table>
<thead>
<tr>
<th>Year of transition</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of ‘unfamiliar’ questions</td>
<td>0%</td>
<td>5%</td>
<td>15%</td>
<td>25%</td>
<td>45%</td>
<td>65%</td>
</tr>
<tr>
<td>Students are currently (March 2012) in class:</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

   It is also recommended that a number of exposure opportunities are provided to students and teachers to such questions through low-stake exams. Gujarat should voluntarily participate in PISA 2015 and also have such understanding based questions in low-stake exams like Gunotsav, Prakrata Shodh, etc.

3. A capacity building plan for teachers, test paper setters and paper correctors.
   This represents the heart of the recommendations and covers extensive capacity building for teachers (starting from class 5). While a large number face to face workshops should be undertaken, a concrete plan and methodology to create video versions of some of the more important courses is also described. In addition to this a plan to create a bank of videos and books in Gujarati is also described which would help increase the overall systemic and institutional capacity over time.

4. A mass education programme aimed at changing mindsets by capturing the imagination of people and connecting with their feelings.
   This would include dissemination workshops and campaigns targeted at parents and the general public to explain the changes planned and the reasons for the same.

5. Changes at the level of the Board’s processes to set high quality error-free papers and new departments to be set up.
   A new process in which groups of paper setters (whose identity is not known to each other) independently solve papers has been detailed. This can ensure error-free papers without sacrificing the secrecy required. In addition it is recommended the Board start two new departments of Psychometrics and e-assessments which would explore new ideas like computer-based and online tests.
2. INTRODUCTION

2.1 The Need

There are many important aspects about Board Examinations – the logistics of conduction, timely announcement of results, error-free corrections, etc. However, the central aspect of these exams, we believe, is the quality of the questions asked in them. Whether or not they should be, the Board Exam question papers have become the goal post of 10+ years of education which includes efforts on the parts of students, teachers and parents – apart from innumerable hours of coaching, tuitions and much more.

In spite of the central importance of these papers to the entire educational system, the nature of the Board Exam questions do not seem to have got that much attention in most of the state or central Boards of India. To quote the National Focus Paper on Examination Reforms (NCF 2005):

*The core of the exam system is the exam paper. This may seem almost a tautological assertion but, given the lack of attention paid by most boards to the quality of the actual exam paper, it is necessary to make it. While actual exam administration and security and release of results have improved in recent years across most boards – mass cheating is down due to more flying squads, most boards release results within 45 days of the end of the exams, etc. – the question papers themselves remain seriously problematic...Indian school board exams are rarely valid tests of desired competencies and broader curricular objectives, even within the cognitive domain.*

The recent poor performance in PISA of 15 year olds in Tamil Nadu and Himachal Pradesh is attributed significantly to the fact that the types of questions in the PISA test were very different from the questions these students (mostly in classes 9 and 10) were familiar with. Students are familiar only with question types asked in their school exams, which follow the types asked in the Board Exams! It is worth reflecting at this stage that PISA is an international benchmark accepted in over 70 countries.

The above examples should clearly establish that there is an urgent need for a state like Gujarat, which is working hard to be a leader globally, to reform the nature of its Board Exam questions. We distinguish this from structural reforms – like making the exams optional, offering more subjects or announcing percentile scores – which are also needed, but are easier to implement. The need is for core reforms – changing the nature of the questions students are asked – is paramount.

2.2 The Problems and the Challenges:

If the task was only to change the type of questions in our exams papers (possibly from the types shown in the left in Figure 1 to those like the one on the right), it would not be a very difficult one. After all a bank of questions can be obtained simply from international assessment papers (a comprehensive list will also be submitted with this project). However, important challenges lie elsewhere:
1. *The Board Exams are a high-stake, multi-stakeholder process:* Every student aspires to write and perform well in the Board Exam; further, for every individual the performance in the exam has important consequences for him or her and the immediate family. Across all sections of society, the stakes of doing well in the exam are closely linked with what they can aspire to do and achieve later. Students, parents, teachers, schools and even colleges that use the Board Exams are directly affected by the process.

The Board itself is a stakeholder as it is responsible to the government, politicians and the public and interacts with paper setters and correctors (drawn from teachers). Many of them are in turn answerable to the media and the public. The extensive coverage of the Board Exam related news in the press is understandable simply because of the importance of the process to lakhs of students and parents.

Tuitions and coaching have become a key part of the Board Exam taking process these days and though many educationists see this as undesirable, the fact remains that they represent huge investments (not just financial) into the Board process. Some believe that large organised tuition classes have a stake in keeping the Board Exams ‘coachable’ and some Board officials shared that any new initiative or attempt to make the Board papers challenging or deviate from the set track is met with cries of ‘out of syllabus’ and complaints from parents – often through the media and state assembly. Many of these, these officials believe and actually instigated by the organised coaching industry.

Whether all of this is true or not, it is clear that the Board Exam process operates under intense scrutiny. There are fears that any change may either lead to a fall in pass percentages due to students not being able to handle the changes (which may lead to a public outcry) or from the point of view of individual parents, their wards doing poorly. An existing system – even with problems gets lesser media attention than good ideas which will almost certainly be accompanied by teething troubles. Preferring a known devil to an unknown one, parents – and all other stakeholders – generally throw their weight behind the status quo.

2. *Perceptions and mindsets need to be addressed carefully for buy-in:* Another interesting characteristic about Board Exams (and school assessments in general) is that though they represent an extremely specialised field, they are extensively experienced by a large number of people. So while setting a Multiple Choice Question (MCQ) requires training and both subject and assessment skills, every test taker may have a view on the positives and negatives of MCQs. In the context of Board Exam reforms, some people believe that an ideal Board Exam would only have MCQs – and if this were done, human error would be completely eliminated from the process. While this is true, a test with only MCQ questions may not test certain other important skills; say the one to effectively argue out one’s position in writing.

To some extent it is true that the need for extreme security in the paper setting process does not allow an as rigorous process of independent checking which can lead to errors in the released papers (ranging from typographical to spelling errors to ambiguous questions, questions without the right answer, etc.) It is also true that the outcry in the event of an error is very high, forcing the focus to shift from a high-quality, challenging paper to an acceptable, but error-free paper. However, here is worth mentioning that almost any prestigious exam –

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¹ Most colleges use the class 12 Board results as the basis for admission, while other institutes like ITI’s use class 10 results. This report focuses on the class 10 Board Exams, though most points apply equally to the class 12 exams too.
whether the IIT JEE or IIM CAT in India or any international exam faces the same challenge and many of these exams do manage to balance these somewhat conflicting requirements. In the recommendations, we describe an overhauled process of Independent Paper Solving which may address these issues.

Another perception we encountered in our discussions is that a question bank of ‘good’ questions would solve multiple problems – that of errors in questions, risk of leakage, and even the dependence on human error and / or temptations! We discuss this in the report and refer to the art of question making and the concept of students being prepared – academically and psychologically – to study, understand and answer a question they would never have seen before. Seen this way, a question bank may be a complementary idea, but not the main solution.

We discovered very different views even on the question ‘What is a good question paper?’ We (and many others) would list characteristics like testing a range of competencies, specifically including higher order and application skills, and discriminating well between students of different ability levels. Yet we found that many believe that a good paper simply as one in which many students would do well!! This could be a consequence of every change being seen from the lens of simply ‘reducing student stress’ and the notion that if every student did well in the exam, stress would reduce. (It probably would not as less objective and hence more stressful criteria may need to be used for admission-related decisions)

The point is that a large number of perceptions – often contradictory – exist and hence the process of change should be gradual to take people along and get the buy-in of as many people as possible. We believe that interaction between groups and people having different views invariably leads to a learning for both the parties.

3. The challenge of capacity needs to be addressed: Probably the most common response we got when we showed the question types from tests like PISA, the IB or the other countries was ‘Our children will not be able to answer these questions’. Usually, this was quickly elaborated further, ‘Actually our students are very capable but are not taught in this way. Our teachers today are not able to teach in the way required for students to be able to answer such questions’.

Similarly concerns were expressed that paper correctors would not be able to set such questions and that even if they were, those who correct would not have the capability to appreciate correct answers which are not strictly according to the correct answer being looked for. (It is in that context that multiple choice questions – which do not depend on the capability of the corrector in any way – are seen as a desirable.)

These discussions made it clear to us that the challenge of building capacity will be central to the process of bringing about the transformation that is required. A detailed, carefully thought through and well-planned capacity building programme would need to be designed to provide continuous and on-demand hand-holding to teachers (and answers to parents, students and others).

This capacity building is necessary not because our teachers or question setters lack any capability or are second to anyone. Rather it is needed because the expectations from their roles for decades now have been different, and to prepare children for the globalised knowledge economy that is already upon us, many existing skills would need to be polished and some new ones developed.
4. **Inertia of change – possibly even opposition to change - needs to be anticipated and overcome:**

All these three challenges listed here lead inertia and even opposition to change. Whether in terms of Board processes of the ‘way things are done’ or the teaching processes used in our classes or new unknown challenges, there will always be a temptation to stick with the familiar and postpone or even avoid change. Without strong support, (and even with support), change will be difficult. Imagine a tuition teacher who has developed tried and tested methods over years and has found them to be successful in helping his students score well in the Board Exams – he may well prefer the existing system and oppose the changes.

This is also clear from the case of the apocryphal parent who supported all the progressive changes planned and completely appreciated both the need for them and their potential effectiveness. ‘Can it be postponed by two years – as my son would have cleared the Board Exams by them?’ he asked!

Identifying and being aware of the challenges that would need to be overcome is the best preparation to meet them. A clear positive is that the urgent need for change is now accepted by almost everyone, and this should help significantly.
3. METHODOLOGY AND CURRENT PROCESSES

3.1 Research Methodology

The trigger of this project is a vision that the Gujarat Class 10 Board Exam question papers would be in line with those from the best school leaving exams in the world and would focus on testing students’ understanding, application and other higher order skills and not merely rote or recall.

In Part A of the ‘Board Exams Reform project’, we have done ‘A comparative study of school leaving exams formats and question types in other countries’. Subsequently Part B of the project details out ‘A 5 year transition plan for shifting the current system into a system which is one of the best’.

The present ‘5 year transition plan’ document for the proposed reform of board examinations took its final shape through the following steps:

1. Understanding the structure of the board and concerns with its processes.
2. Understanding the key challenges of conducting the examinations from board officials’ and administrators point of view.
3. Understanding the concerns of students, parents, and teachers.
4. Meeting other senior officials, educationists and retired bureaucrats.
5. Studying the structure of different boards across the world.
6. Learning from top performing countries and identification of key differentiators.
7. Studying transformation programmes around the world.
8. Providing key actionables and recommendations.

Providing a transition plan requires an innate understanding of the existing system, associated shortcomings and challenges. As a first step to the present research we interacted and interviewed many present and ex-officials associated with Gujarat Secondary and Higher Secondary Examination Board (GSHSEB) in order to develop a greater understanding of the board’s process and systems. Details of these meetings and the views expressed are described in Appendices I and II.

In the second step we made an attempt to understand the key challenges the board faces in order to conduct a fair and smooth examination. For this purpose we held deep and meaningful discussions with key officials of the board involved in these processes.

Developing an understanding of the system requires a close and intense interaction with all the stake holders. Apart from the board officials and key decisions makers’ we interacted with a number of students, parents, teachers, school administrators, and college principals in the third step of the research.

Naturally given the array of stakeholders involved we expected to be saddled with a multitude of varied and often contradicting opinions. Even on matters of near consensus we would not be sure if the consensus itself was a scientifically valid one. The best way to resolve this dilemma was to consult people with experience in this domain. These included eminent educationists, experienced administrators and other participants of the reform process. These experts have
been those who have experienced the systemic issues first hand, have been working diligently as a part of the system and have been willing to willfully opinionate and become active guides in seeking a plausible solution.

No system can seek to reform itself unless it is willing to learn from ‘others’. Consequently in the fifth step we made an attempt to understand structure of various other boards across the world. One important aspect of that study was the review of various assessment rubrics used by different boards. Mere understanding the structure was probably not enough; therefore we reviewed and analyzed to find the key differentiators between GSHSEB and other boards as the sixth step of the research.

Many countries and regions have shown unique transformation in way they teach and assess their children, over last few decades. We have also made an attempt to draw key learnings form these transformation studies. McKinsey’s two reports ‘How the world’s best-performing schools systems come out on top?’ and ‘How the world’s most improved school systems keep getting better’ were particularly studied in depth.

The Final step was to provide key actionable and recommendations along with a proposed time line. Some of the actionable included: Proposing a transition cell equipped with an advisory board, technical expert, subject matter experts etc., A time line to implement some of the key differentiators (including teaching methods, setting unfamiliar tests etc.) and some other ideas like ‘Setting a psychometric department’, ‘Gujarat Secondary board bidding for educational projects’ and so on.

3.2 Current Gujarat Board Examination Process

1. Process of Question Paper Setting
   - Identifying papers of the setters are chosen from an existing pool and selecting new setters who are interviewed and selected. On average 30% are new paper setters are new
   - Paper setters set questions from specific topics (question setting), this ensures completely secrecy.
   - Questions as received from different setters are assembled to form a paper.
   - Usually 2-3 sets of papers are made. However, some years’ unused sets may also be used.
   - Finally only one paper is chosen as final ‘question paper’ for a particular subject.

2. Conduction of Examinations
   - There are more than 9000 schools with a total of 9 lakh students.
   - Examination forms are distributed to schools through 42 distribution centres.
   - These centres are ideally the nodal schools in different districts. Larger districts have more than one centre.
   - The forms are collected and the data entry is done by different agencies.
   - The data entries happen at three zones: (i) North Gujarat (ii) Central and South Gujarat (iii) Saurashtra and Kutch.
   - Pre list (Preliminary list of hall tickets) is prepared and sent to schools for verification.
   - Hall tickets are distributed through the three zones.
   - Various sub processes include: Block building (1 block = 30 students); Creation of School Muster Centre Muster and District Muster; and Packing Memos (Number of Packets per school).
3. **Evaluation Process**

- There are around 200 centres for evaluation.
- Each centre is assigned a subject and then the evaluators are selected.
- Evaluators are selected based on their experience and educational qualification.
- One answer paper is evaluated by a panel of four evaluators and a moderator.
- Four evaluators evaluate four different sections of a question paper.
- Evaluators have to refer the model answers (keys) provided to them.
- Moderators recheck the evaluated answer papers based on pre-set criteria.
4. CHANGES RECOMMENDED AND OVERALL APPROACH

4.1 Transition Plan Structures:

*Based on a clear vision, draw up a transition plan with structures to support the same:*

The Board Exam papers represented by the quality of their questions serve as the goal post to the entire education system. This is what the system aims to achieve and what it measures itself against. Seen in this light, the goal of a high quality education system will be achieved when the question papers are of extremely high quality and students overall perform very well on them – in line with the best students in the world.

The Vision for the Board Exam Reform process, therefore, is that the Gujarat Class 10 Board Exam question papers would be in line with those from the best school leaving exams in the world and would focus on testing students’ understanding, application and other higher order skills and not merely rote or recall. This transition will happen gradually over a 5 year period.

In order to drive and facilitate this transition we recommend the following:

- **An Advisory Council** consisting of educationists from different disciplines, domains of testing and assessment, eminent persons, parents, politicians and government representatives be set up to provide overall guidance for the overall process.

- **A special Transition Cell** be formed in the Board. The number of officials in the Transition Cell may vary over the course of the 5 years – we recommend it be started off with 3 members initially co-opted from existing Board Officials. The Chairman of the Board should be the head of the Transition Cell.

- **A larger Task Force** consisting of teachers, principals, subject and domain experts should also be formed. This Task Force will meet from time to time and may co-opt additional members as required for specific tasks. In a sense this Task Force will be function as an extended arm of the Transition Cell and also serve as a link to schools and the external stakeholders.

- **A Technical Support Programme** be created aimed at seeking support from assessment and education professionals for officials of the Gujarat Board. This may be released through a tender and it is expected that leading international as well as national agencies would bid to provide technical support on test construction and question making to Gujarat Board including an identified team of teachers and experts. (The process is somewhat similar to the SSA Technical Cooperation Fund aimed at building capacity in the NCERT). This support should be for a 3 year period and would be aimed at developing internal capacity in the Board in assessment and question making.

We recommend that the Transition Cell details out the Vision and Action Plan given in this report modifying parts as necessary. This document will provide a clear visibility and roadmap for the various action steps needed. A key part of the document should be samples of the present and proposed question papers in all subjects as they would transition year-wise over the 5 year period.
In terms of timelines, it is recommended that the Advisory Council, Transition Cell and Task Force be set up within 3 months. The processes to start the Technical Support Programme should also be started off at that time, with a view that the actual technical support start within a year from the acceptance of this report.

*The need for gradual change:* It is important that a project with far-reaching implications like this one be taken ahead gradually as transparently as possible taking all stakeholders along and proceeding from stage from stage only when there is buy-in from concerned stakeholders.
5. TRANSITION PLAN – PAPER FORMAT AND STUDENT SUPPORT

5.1 Transition Plan 5 Year Road Map

Draw up and publicise a clear 5 year roadmap for the changes in the questioning pattern along with strong multi-pronged support for students and teachers

The current Gujarat Board Exam question papers have questions which are mostly either straight from the textbook or test a procedure that is explicitly described in the textbook. Anything which does not conform to these 2 patterns is often deemed to be out of syllabus (by students, teachers and the media). This is in sharp contrast to the pattern of leading countries and Boards where questions straight from the textbook or involving a direct procedure would be uncommon (less than 30-35% of the paper).

The best international exams clearly have a majority of questions that require students to think critically or apply their learning in a new situation. We can call such questions ‘unfamiliar question types’ as they are of an unfamiliar form and the student would most likely not have seen that specific form of question before. These questions are not simply unfamiliar, but are also often understanding or application-based or testing higher order skills.

It is interesting to note, therefore, that while the student of an exam like the IB or in a country like Finland or Hong Kong expects that most questions in the exam would be unfamiliar to him or her, a Gujarat Board Exam student mentally considers such questions as ‘out of syllabus’. Ironically, Indian students who write fiercely competitive exams like the JEE or CAT again expect unfamiliar questions! Thus the goal is to not only introduce more and more unfamiliar questions as a percentage of a Gujarat Board Exam paper but in this process change student thinking about what to expect from them. In order to do this, the percentage of such questions over a 5 year period should be explicitly announced – we propose the following increasing scale over a 5 year period.

<table>
<thead>
<tr>
<th>Year of transition</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td>0%</td>
<td>5%</td>
<td>15%</td>
<td>25%</td>
<td>45%</td>
<td>65%</td>
</tr>
</tbody>
</table>

Fig. 2: A 5-year transition plan to increase percentage of understanding-based ‘unfamiliar’ questions in the class 10 Board papers from current 0% to 75% in line with the best school-leaving exams in the world.

The principle used here is that the student who has only 1 year to prepare for the change is affected very slightly by the change – only to the extent of 5% of the paper being different from

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2 HKDSE’s Integrated Science Paper was analysed on four parameters, namely, whether the questions test ability to (i) reason conceptually (ii) exhibit application of acquired knowledge (iii) relate and interpret common events and occurrence from a scientific aptitude and finally (iv.) reproduce acquired knowledge. Analysis revealed around 70% of the questions (by weightage) were found to satisfy the first three parameters, while rest 30% seemed to qualify for the fourth parameter.
the past. However a student who has 3 years to the paper should be prepared to have 30% of unfamiliar questions. Thus, schools and teachers have time to help such students prepare for the Board Exam format in the year they would write it.

5.2 Concerns about Students’ Overall Performance Drop

*Will our students – including in the rural areas - be able to answer such papers? Won’t the performance drop precipitously?*

This is indeed a valid concern. If we merely changed the question papers and did nothing else, student performance would fall unacceptably and consequently there would be a huge resistance from parents and schools. This is because students are being prepared for a certain type of exam and unless that is changed, the new type would not work.

At the same time, it must be recognised that this presents an opportunity at a time when India has opened its doors to International Benchmarking. We need an education system that helps students perform on par (and then much better) than their international peers. What better way to rally the entire system around this goal than by changing the goalpost and then supporting students and teachers to aim for the new goalpost? Key initiatives which would help achieve that and gradually start off system-wide transformation are described next.

5.3 Multipronged Support for Students and Teachers

*Multi-pronged Support for Students and Teachers to tackle the new exams*

Discussions with teachers and educationists on the reasons they believe students would find the new question formats difficult reveal the following:

1. “Students are intelligent and capable, however they have not been provided any exposure to questions like this since the focus was on traditional question types and exams only.”
2. “If teachers can be trained to make and teach for understanding and provided support towards the same, they would be able to do it. However, it is important that the system convey that developing such understanding among children is important.”

In other words, the larger system (represented by the Examination Board) needs to convey that this change is a serious one and then provide the appropriate information and support to students, teachers, parents, etc. We see this as an extremely do-able task – an analogy would be the Gunotsav initiative – which is taken very seriously by teachers and schools because of the messaging received. Specific actions directed at students are discussed here. Capacity building for teachers is discussed under point 3 and the advocacy point to make parents and others aware is discussed under point 4.

A. *Gujarat should participate in international assessments like the PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Studies).* There are 3 significant benefits of the same: a) teachers, students and others get a taste of what international students are being expected to do, a bank of sample questions and a picture of where we stand as a state; b) Opposition to change reduces both because it becomes clear that we need to improve a lot and that these new ideas are well-tested in a number of countries – including neighbours in Asia and countries similar to us and c) support from parents and the general public will increase because it can be clearly shown that the change being attempted will help our students
perform better compared to their international peers. Of course there will be criticisms initially in the media and elsewhere because the results are likely to be negative and there must be a readiness to face that and convert it into a rally for change.

**There is an opportunity for Gujarat to proactively agree to participation in PISA 2015 and this is strongly recommended.** Though this may lead to a poor result, it can also provide a fillip to a determined state’s efforts to use the intervening 3 years to try and push reform that can help students learn better. The state may have to confirm by 2012-13 for 2015 participation.

**B.** Provide copies of tests for understanding for students right from class 3 onwards (see Figure 3). Use question formats in the annual tests including in Gunotsav that incorporate questions based on understanding and having formats that may be a little different from the standard, familiar forms. This helps students to be prepared for unfamiliar questions and encourages teachers to make such questions by giving them ideas.

**C.** Post-test dissemination – whether after an international test like PISA or after Gunotsav or a State Talent Test must be a regular feature and used as an opportunity to discuss question paper formats and question types. Such disseminations also help in teacher capacity building. Video as well as media like BISAG can also be used for such disseminations.

**D.** Talent or Scholarships tests are also a powerful method of sharing and promoting good question papers and examples of good questions. However, the current Gujarat State Talent test is extremely rote-memory based – this should be changed – if necessary by outsourcing it to a capable technical agency.

**E.** Gunotsav should be introduced in the Secondary classes also and have such question patterns (including questions from tests like the TIMSS and PISA). Since the Gunotsav is a low-stakes test, it becomes a unique opportunity to share examples of good questions without students or teachers feeling uncomfortable that poor performance affects them negatively in any way.

*If Gujarat decides to participate in PISA 2015, it will send out a strong, positive message about its seriousness to benchmark itself against the best in the world. It also has 3 years to work on improving the learning levels of 15-year olds. Though the performance may not be very good, it would give a strong fillip to all quality improvement efforts in the state, including reforming the Board Exams.*
F. Post-assessment analysis of test papers should be published following every Board Exam. This would have samples of student answers highlighting good answers (and why they were considered good) as well as other others that were not considered up to the mark. This could be a priced publication. This would give feedback to both teachers and students of what is expected in the answer booklets.

This may not seem very important when the Board questions follow a set pattern across many years, but when there is a change in this, such a publication would be very useful. Many examination boards across the country publish such documents following exams they conduct.

G. Many countries offer copies of their past year question papers as priced publications. In partnership with boards having good quality questions, books can be published having samples of these questions translated into Gujarati and other languages. Teachers and students can be encouraged to submit answers to these questions and the best ones could be awarded and recognised. Similarly, the questions at the back of each chapter in the textbook should also be of innovative types (rather than many questions following a similar pattern as exists today)

H. Through these and other methods, while students, their parents and teachers should be made as familiar as possible with various types of questions testing different competencies, the message should also be clearly given that in a test, one may get questions of a type one has never seen before. The best student is one who has understood all that was taught in class and is able to use that understanding to interpret and solve the exam question correctly!
6. CAPACITY BUILDING

Devise a capacity building plan – specifically covering all teachers, but also question setters, correctors and Board personnel

The capacity building plan is in many ways the central part of the action plan. In addition to traditional workshops and seminars, certain initiatives are being suggested that will help build overall system and institutional capacity so that the action does not end with a series of training programmes. One of them, for example, is the systematic creation of high quality material in book and video form in Gujarati both through translations of good material as well as indigenous creation. The measures will work in tandem with the other changes proposed in the Board in point 4.

The capacity building initiatives are primarily targeted at 4 groups:
- primary school teachers of classes 5-8,
- secondary school teachers (classes 8-9),
- question-setters and
- question correctors

The last two groups are actually drawn from the secondary teachers only – however they are being treated separately as they need specialised training and inputs. Academic support personnel like CRCs, BRCs and EIs will also be covered along with their respective teacher groups. (The capacity building initiatives for the Board officials are not discussed in this section, but have been referred to under the Technical Support Programme in point 1 and Board level Initiatives in point 5.)

It should be mentioned here that Board led training initiatives normally focus only on secondary school teachers, however, the changes being sought to be made here are substantial and unless teachers from class 5 are covered, secondary teachers alone will not be able to bring about the changes needed. This point is accentuated with class 8 being moved into primary – effectively meaning that secondary teachers cover only classes 9 and 10.

The aim of the capacity building programme is to bring about a change, firstly in the level of understanding of the teachers and secondly in their practice. It is for this reason that the capacity building programme does not rely merely on trainings, but creating materials – written and video – that would continue to serve as a resource bank to be referred by the trainees whenever they need it. Such materials will allow the capacity building to be available on-demand – teachers can refer to the materials or see the videos whenever they need to refresh themselves, rather than only at the time of the training. Needless to say, all the materials will be available free of cost to teachers in the Gujarat schools accessible wherever possible through the internet.

The board should also take external help for 2-3 years from one or more qualified technical agencies to develop these courses. (A list of courses is given later.) A core team of teachers (some from the Task Force mentioned earlier) should be identified and linked both to a class-topic combination (for example class 9 – Science) and specific courses (say Video Analysis of Teaching Practices in Other Countries). These teachers should undergo training with the external agency through a number of processes, but including embedding, a process in which they will actually work closely with and possibly out of the agency’s premises thus developing
the requisite skills. The outputs will be deliverables of the agency, especially in the initial years. In this manner within a 5 year period, the core team will become fully independent and capable of handling both the training and test development aspects of the new pattern of question papers.

The capacity building plan consists of the following initiatives:
1. Designing courses
2. Creating a bank of video materials and courses in Gujarati
3. Creating a bank of quality material in Gujarati through an on-going translation programme
4. Organising regular activities including competitions and exchange programmes for teachers
5. Rolling out the trainings – both in face to face and ICT formats.

To accomplish this, many other Gujarat agencies (including, for example, the Gujarat Institute of Educational Technology (GIET), BISAG, SCOPE, KCG, etc.) as well as external agencies and individuals would play a key role. Each of the initiatives is described below.

### 6.1 Designing Courses

The approach will be to identify the courses needed for teachers, paper setters and paper correctors. A sample list is provided below. These courses will then be planned as workshops, but some of the more important and popular courses (especially those for teachers) will also be provided in video form. Video courses will be similar to the courses delivered by the instructor and are described in the next section.

For some of the courses, it may be advisable to invite faculty from across the country or even foreign universities, boards or research organisations. Before finalising the courses and their design, some of the best existing courses internationally – both those offered online and face-to-face should be studied. In some cases, formal tie-ups should be done – this will allow existing courses to be translated in Gujarati and trainers to be certified. A tentative list of sample courses is presented below.

<table>
<thead>
<tr>
<th>Course</th>
<th>Teachers</th>
<th>Paper Setters</th>
<th>Paper Correctors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment Principles</strong></td>
<td></td>
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<tr>
<td>Understanding studies like TIMSS and PISA</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>An introduction to modern psychometric methods like IRT and Scale Anchoring</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>The role of examination Boards internationally</td>
<td>✔️</td>
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<tr>
<td>How e-assessments are changing assessments</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td><strong>Improving Teaching Practice</strong></td>
<td></td>
<td></td>
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<tr>
<td>Understanding by Design</td>
<td>✔️</td>
<td></td>
<td></td>
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<tr>
<td>Textbook review and analysis</td>
<td>✔️</td>
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<tr>
<td>What good teachers do differently - a video analysis</td>
<td>✔️</td>
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<tr>
<td>Teaching in different countries – a video analysis</td>
<td>✔️</td>
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<tr>
<td>Good classroom practices in secondary teaching</td>
<td>✔️</td>
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<tr>
<td>Teach like a Champion</td>
<td>✔️</td>
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<tr>
<td>Course</td>
<td>Teachers</td>
<td>Paper Setters</td>
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<tr>
<td>E-Learning – Modern Developments</td>
<td>✓</td>
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<tr>
<td>Need for a new Science of Learning</td>
<td>✓</td>
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<td></td>
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<tr>
<td>How research is helping in teaching and assessment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Differentiating between Mechanical and Conceptual Learning</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
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**Question Development**

| Workshop on making effective questions                               | ✓        | ✓             | ✓                |
| Workshop on making good MCQ questions                                | ✓        | ✓             | ✓                |
| Different types of questions and their uses                          | ✓        | ✓             | ✓                |
| Using performance tasks and portfolios to create good internal assessments | ✓        |               |                  |
| Assembling a good paper                                              |          | ✓             |                  |
| Concepts of Bloom’s Taxonomy and Blended Learning                    | ✓        | ✓             | ✓                |

**Paper Correction Processes**

| Correcting subjective questions – Marking Schemes                     | ✓        |               |                  |
| Making, understanding and using assessment rubrics                    | ✓        |               |                  |
| An introduction to technology in assessments                          |          | ✓             |                  |

6.2 Creating a Bank of Video Materials and Courses in Gujarati

With technology becoming cheaper and more easily accessible, both creating and viewing video is becoming easier. For the changes planned to truly become a part of the repository of every teacher, the focus has to be not just on training, but creating a bank of high quality material that can be used by teachers over a number of years.

We recommend that one of the important initiatives of the cell focussing on these reforms be to create a bank of high quality video material. We classify these materials into 4 categories:

- **Video courses**: The courses which are expected to be high demand or would be done by a number of teachers should also be created as ‘video courses’. Video courses will be provided to the user in video chunks of between 3 and 10 minutes each with some question or exercise at the end of each of the chunks. A unit overall would correspond to a ‘session’ and totally be for about 60-90 minutes. Every unit would be followed by an exercise, which if necessary can be graded. A full course would consist of 6-10 units (corresponding to 6 to 15 hours of content). A certificate may be provided at the end of the course.
Fig. 4: Based on the TIMSS international benchmark studies, a large number of classrooms in many countries were video-recorded – all of Maths and Science topics of Class 8. These videos, with subtitles where required, are available for free viewing and download at http://timssvideo.com. Such resources can be invaluable for teachers and should be developed indigenously also (apart from creating Gujarati subtitles for the available material.)

Fig. 5: It is critical for both teachers and question paper setters to recognise that some ideas are central to a topic, while others are peripheral. The central ideas must be emphasised and disproportionately focussed on. This is one of the core ideas behind the Understanding by Design framework.

(from The Understanding by Design Handbook by Jay McTighe and Grant Wiggins)

b. Gujarati versions of existing quality video content: Already available high quality video material that needs to be translated and then sub-titled or recorded with a voiceover so that it can be used by teachers in Gujarat. Examples of this would be the TIMSS Videos\(^3\), TED videos or even videos created by the Homi Bhabha Centre for Science Education, Mumbai.

c. Short videos created locally by the Board or other agencies that present information on topics that are important or current, however, the original form as a book or research paper may not be easily accessible to teachers. For example, 15 minutes talks or presentations can be created in video form on topics including the TIMSS and PISA Reports, Adaptive Testing, Understanding by Design, etc. Video reviews of good books can also be made available. In many cases, the hope is that the dedicated teacher, inspired by the video trailer, will access and study the original source subsequently.

d. Teacher created videos: The fourth category would be videos created by the teacher community. Again these could be of 2 types – videos of good teaching, where a teacher video records his or some other teacher’s classes or videos of student learning and misconceptions. These videos would go through a process of moderation and maybe even back and forth comments and feedback before they are added to the resource pool.

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\(^3\) Videos of full classes of Class 8 Maths and Science in a number of countries including Germany, Australia, Hong Kong, etc. are released as part of the 1999 TIMSS Video Study (more details are available at http://timssvideo.com)
6.3 Creating a Bank of Quality Material in Gujarati

Along similar lines as described for the bank of video resources, a high-quality bank of publications in Gujarati relating to modern educational ideas should be created. We recommend the following specific actions:

a. *Translations of high quality books and materials in Gujarati*: We recommend the publication of research studies like the TIMSS and PISA Reports, books like ‘The Teaching Gap’ and ‘Teaching like a Champion’, reports like McKinsey’s ‘How the World’s Most Improved School Systems keep Getting Better’ and magazines/journals like Educational Leadership. All these represent high quality material already available but not accessible by teachers in Gujarat.

b. ‘Parichay Pustika’- like material: The Mumbai-based Parichay Trust for the last 50 years has been publishing pocket-sized books on varied topics in science, literature, personalities, etc. in Gujarati. Each booklet has 30-50 pages, is written well and priced at Rs 10! We recommend that a similar set of regular publications on topics of importance to teachers be published once a month initially. One of the earlier booklets could describe the planned reforms, the reasons for the same and the steps planned. This would be an aware-cum-capacity building initiative.

c. *Educational resource materials*: Here we recommend a regular publication which could devote a section each issue to the changes planned and the progress against the same. In addition material like the following should be published regularly:
   i. Past test papers from other countries / states
   ii. Post assessment analysis of student responses
   iii. Rubrics and Marking Schemes

6.4 Organising Competitions and Exchange Programmes for Teachers

The purpose of these initiatives is two-fold: one, to get more teachers to participate in activities that would be fun, but also help them professionally. Gradually through this, the second objective of identifying high-quality teachers will be achieved.

Examples of competitions for teachers could include the following: a regular Question of the Month (at different subjects and levels) – these questions would be thinking based questions – teachers have to answer it, say what students would answer and submit an explanation for the answer. A second competition would be for teachers to submit good questions or activities – these could include both physical as well as digital activities. In all these cases the good submissions will both bring recognition to the teacher and contribute to a bank of quality resources.

Gradually, the need would be to move on the higher level competitions including submission of articles by teachers. Teachers should be encouraged submit papers to peer-reviewed journals (initially at the national and later at the international level). Such publications should be encouraged and if possible the authors supported to present their papers.

Every year a fixed number of teachers, (say 10-20) should be selected through a selection committee based on their participation and quality of submissions and sent to participate in international conferences on topics related to their work and interest. Similarly at least 3-5
international experts should be invited talk and do workshops and selection to be present in these workshops should be a matter of honour.

6.5 Rolling Out the Trainings – Both in Face to Face and ICT

In consultation with the Advisory Council and the Task Force members, a year-wise plan of conduction of courses, development of video courses where required and roll-out of both face-to-face and video-based courses should be made. The plan proposed below may be considered one possible approach.

**Year 1:** Ideally at least 10 courses should be developed through the year, 3 each focussed on paper setters and paper correctors and 4 for teachers. The courses for teachers should be developed based on an analysis of videos of best performing classrooms and secondary research. The courses for paper setters and paper correctors should be prepared by organising workshops on the relevant topics, possibly under the aegis of an external agency or consultant. The first year should also include public dissemination of the findings of international studies like TIMSS and PISA and conveying the message that there is a need to focus strongly on the quality of education. The proceedings of these seminars should be documented and professionally video recorded, so that they can be used further across different zones of the state.

**Year 2:** In the second year the developed courses should be rolled across different zones of the state; modalities of such trainings should be worked out in consultation with the ‘transition cell’. Courses on introduction to modern psychometric methods like IRT and Scale Anchoring and assembling a good paper should be developed in the second year.

**Year 3:** The new courses developed in the year 1 and year 2 should continue to be rolled out in the year 3. The third year should be a year of focussed technical discussions. Orientation of educational planning tools and techniques like understanding by design (UbD) and Teach like a Champion (Doug Lemov, 2010) should take place through focussed group discussions. This year should also be utilised for equipping teachers with deeper Concepts of Bloom’s Taxonomy and Blended Learning. External agencies and experts may be hired for this purpose. These agencies need to work in close coordination with the specially allocated personnel under the transition cell of the board. Concepts like ‘new science of learning’ should also be introduced in this year. All the proceedings and discussions in the lecture series should be recorded and can themselves be utilised as ‘learning courses’ for future.

**Year 4:** The fourth year should be focussed on development of technology and e-learning based courses. Courses developed in Year 1, 2 and 3 should continue to be field tested for in Year 4.

**Year 5:** By year 5 all the courses listed (refer table. a sample of courses) should be ready in all aspects. A training calendar should be prepared and training and capacity building should be made an on-going process.
7. RECOMMENDED CHANGES AT THE BOARD LEVEL

7.1 Changes in the Board

A number of critical initiatives have been suggested as a part of this project. There are also others which are not directly related to the reform of the question papers, yet very important – for example, offering the Board Exams in a Computer Based Test (CBT) form or even an online form. In this section we discuss some of the changes recommended in terms of the processes and structure of the Board that will support both these types of initiatives that may need to be taken now or in the future.

*Obtaining the buy-in and active support of Board officials:* In all our discussions, we sensed a strong positive approach on the part of the Board officials, a pride in their work, an openness to discuss the challenges and a willingness, even keenness to try new ideas. There was also a pride to belong to a Board that has taken a number of progressive and proactive decisions in the past and has the financial wherewithal to try new things. This is one of the reasons we recommend that all these attempted reforms be situated in the Board and the Board officials are first taken into confidence and own these ideas (with the flexibility to discuss and modify them as required). The officials should understand and agree on the needs for the shift and ideally become vocal spokespersons for the shift. Though not elaborated elsewhere, programmes and workshops to discuss these ideas and proposed changes and seek the inputs and suggestions of Board officials would be a pre-requisite to everything else that is proposed here.

A summary of some of the changes recommended is as follows:

1. **Modifying the current Board paper setting process, mainly adding a process of Independent Paper Solving to check potential errors that may occur in the paper:**

   One of the biggest concerns expressed to us in our discussion was that partly due to the demands of secrecy, the review and check of a Board paper is probably not as thorough as it could be. This leads to errors of different kinds – ranging from formatting or spelling errors, to ambiguous questions to questions that have no correct answer given. (We were told about a recent case where the ‘X axis’ label of a graph was marked with a lower-case ‘x’ where the convention is to use an upper-case ‘X’ and led to protests by some parents.)

   (Sometimes a question bank is proposed as the solution, but we believe it is weak in all three respects – a) a thorough check of a very large number of questions is always difficult b) the leakage of question bank would actually encourage more coaching and tuitions and rote learning c) the whole idea of innovative questions that have not been seen before – a characteristic of all great exams whether the IIT JEE or CAT in India, or the international Board papers we studied, is lost.)

   So, is there a solution to have a higher quality checking while maintaining the secrecy needed? We think there is and recommend the following: the core idea is that there should be an Independent Paper Solving under which more than 1 person who has not been involved in setting a paper independently solves it and their solutions are independently compared.
Specifically, the idea would be implemented in this manner: 2 or 3 teams of 6 people each are responsible for setting the paper in that each subject. Let us call the members A, B, C,.. F. Only A, B and C know that they are part of the team – they set the paper and D and E solve it independently. D and E are supposed to solve each question like a student and also comment on anything question-wise or overall that they find inappropriate. F is the moderator for this team and receives the paper and the solutions of D and E and compares them, and files a report. Apart from other points, the report should comment one-by-one on every question that

- is answered wrongly by either solver
- has a comment by either solver or
- has an answer mismatch between the 2 independent solvers

F may discuss these points (without revealing the identities of D and E) with the A-B-C team and seek specific changes before finalising the paper.

Thus 2 or 3 papers (depending on the number of teams) are created out of which any one (or a mix) can be chosen, but each paper has been independently solved and checked by 3 people. An error can creep in only if D, E and F – who are not involved with the actual paper making - all miss it. While A, B and C work together, they do not know the identities of D, E and F. Timelines would also be defined for the process and the payments to team members would be higher than the current levels, but the bulk of the payment should be linked to the papers being found to be error-free and no leakage occurring.

2. A number of other important ideas and suggestions to improve the Board Exam paper setting and correcting process

a. We understand that the process is already underway to report Board results in terms of percentiles. Using percentiles and later scaled scores takes care of issues of slight changes in difficulty across years, improves comparability and is standard practice in most international examinations. Scaled scores are in fact, superior and more correct than percentiles because there will only that many percentile positions as the actual number of marks scored (say out of 100) by students, whereas scaled scores provide weights to questions based on how difficult students found it.

b. More effective use of Rubrics and Marking Schemes: It has been discussed elsewhere that good question papers must have a mix of all types of questions – while objective questions have their advantages, it would not be correct to rely completely on them. One reason Indian boards have moved away from long answer (or ‘free-response’ questions) is that their correction is seen as a more discretion-based process. However, when student learning is being measured, especially where their ability to express is the skill in focus, the discretion of an expert is desired. While this requires that question correctors be experts (if necessary by paying better for their services) – the more important process that can ensure this is the effective use of Rubrics and Marking Schemes for marking free-response questions. Samples of these from certain international tests are shown in Appendix IV

c. Release of Student Performance Analysis after each Board Exam: Some months after each Board Exam, a report should be released if possible showing samples of student answers and comments on the same. Good answers, average answers and bad
answers should be shown both to serve as exemplars as well as to show teachers the common mistakes students are making. Such publications will also shift the discussion following a Board Exam to learning, quality of questions, etc. and help generate buy-in for the entire change process being planned.

d. Another idea we found in some international exam paper was the provision of space for writing the answers to subjective questions in the question booklet itself. Considering that blank answer sheets are provided anyway, this should financially not lead to an increase of allocation. There are 2 potential advantages: 1. The space provided clearly indicates how much is to be written, protecting against very large or very short answers and 2. Gradually this allows for a practice where even subjective answers are scanned and corrected on the computer – this may help improve the overall quality of correction. Unlike the other suggestions, however, at this point, this should be considered an idea to be examined and considered.

3. **Strengthening the research base: closely studying other international boards and setting up a Psychometrics Department in the Board**

Appendix V provides information about some leading examination boards around the world. There is widespread acceptance that in a knowledge society, innovation would be a key driver of success. Innovation itself depends on an extremely effective education system, which in turn depends at least partly on an effective assessment system. Psychometrics is the research area which focuses on building effective assessments especially at large scales. With the widespread availability of computer technology and statistical tools, methods like Item Response Theory can be used to more accurately understand learning and how it can be measured, towards the ultimate goal of improving learning.

The field of Psychometrics has not received attention in India and we are not aware of any Board having a department of Psychometrics – neither for example does the Indian Statistical Institute. In sharp contrast, every leading exam board or assessment institute would have such a department having a number of dedicated researchers. We recommend that the Gujarat Board set up this research department possibly in collaboration with the Gujarat University. This would actually provide the research base needed to implement many of the other recommendations.

4. **Setting up the e-assessment Department in the Board**

The other department missing in our boards is the e-assessment department. The face of assessments has changed with e-assessments which is an entirely new discipline. To give an example, it is one thing to give a common test paper to say 1 lakh students and calculate their absolute and relative performance and quite another to attempt doing the same if those students had the flexibility to take their tests at any time or even a set of times through the year.

When can the Gujarat Board look at a scenario of offering the Board Exams as a Computer Based Test? The availability of low cost tablets (like the Aakash) is also encouraging e-learning and e-assessments.

Adaptive testing is a process by which students can be tested more deeply at their level or areas of expertise – so in the same amount of time, students may receive easier or more difficult questions and an overall more detailed picture of their performance is obtained.
A number of international researches today are focussing on measuring the equivalence between computer-based tests and paper tests because there are situations now where some students take a test on computer while others may take the same test on paper (this is for example, being experimented with the next round of the PISA assessments)

In this section, our aim was not to give concrete recommendations on these aspects or even discuss these options in detail. Rather, the recommendation is merely that an e-assessment department should be set up in the Board.

5. Based on the above, the Board should begin to bid proactively for projects related to assessments around the country and the world

The exam board of the present and future is a complex, high-IP organisation with a strong based in research and an ability to execute at scale. We recommend that the composite vision for the Gujarat Board include this. Across the world, student learning is gaining significant focus and assessment research is a highly sought after capability. Many international tenders are released (the recent PISA tender to develop frameworks for assessments, computer tests is one example, but gradually almost all countries will seek expertise in improving their assessment systems.)

The organisations participating in these tenders include private education companies, but also Examination Boards and University Departments from around the world. Many organisations are well-regarded for their capabilities in this field.

Our recommendation is that it is possible for Gujarat Board to develop expertise and bid for these projects internationally. This would both help it make a difference to student learning at an international scale and to generate valuable revenues!
8. ADVOCACY MEASURES

8.1 A Detailed Advocacy Plan

Have a detailed advocacy plan aimed at disseminating the plans and also addressing mindsets

This Board Exam Reform project aims to improve the quality of the exam process, especially questions, so that the overall levels of student learning improves. The benefits of this will accrue to everyone: individuals, families, educational institutions and to the state and society as a whole in terms of higher growth and incomes but also a more educated society. However, any change is accompanied by fears and apprehensions and this may be even truer for this one as it requires regular practices to be changed. Also, when exam patterns are changed, this causes apprehensions even panic and this may increase if better question papers reveal that learning levels are not up to the mark. The whole-hearted support of the education system including teachers and parents would be a critical success factor the success of this effort. It is for this reason that a pro-active advocacy plan be in place right from the start of the project. We recommend the following as the key elements of this advocacy plan.

1. Workshops within the Board to explain the plans and obtain understanding and buy-in.

2. Proactive dissemination plans using workshops including video explaining what assessment systems like PISA, TIMSS, Pratham’s ASER and EI’s Student Learning Study do, why they are important and what their findings are. Separate dissemination plans may be needed here for parents and the general public on the one hand, and teachers and schools on the other.

3. Public education debates on ‘What is Quality Education?’ and ‘What is a Good School?’ also need to be initiated. This may include Public Lecture Series, discussions and debates, series of articles, etc.

4. A large scale media campaign should be promoted, which will leverage the sentiment of Gujarat to shine (like the Vibrant Gujarat) while also creating dissatisfaction with the existing system – possibly through comparisons on where we stand with other countries. Some of these campaigns should involve parents encouraging them to interact with the school and question if, and how well their children are really learning.

5. Short films may also be commissioned explaining what changes are being planned and why and how they will be rolled out.

6. Books may be commissioned on some of these topics – a number of good books may be translated and made available in Gujarati – some of these are described in detail in the chapter on ‘Capacity Building’

7. Like it is done to build awareness on missions like Polio Eradication, eminent personalities may also be roped in to convey messages related to the importance of education and the changes that are necessary.

In addition with the other initiatives, strong communication and an active advocacy programme at multiple-level can help ensure the success of these transformation efforts.
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Appendix 1: Discussions with Stakeholders: Students and Parents

In the student and parents interviews a sample of respondents were interviewed. This sample comprised both of students of 9th and 10th standards and their parents. The sampling was done from four socio-cultural regions (SCRs) of Gujarat. The sample also included a proportionate representation of urban/rural, socio-economic and gender population.

Students’ Concern

1. Rural students consider 10th exam as an important milestone in their educational, economic and financial progress.
2. Urban student seem to attach comparatively lesser importance to 10th board exams.
3. Two reasons for rural students considering this as an important milestone are that the exams have more credibility and it also allows them to compare and compete with urban students.
4. Urban students do realise that it is the first externally assessed exams for them before the more critical 12th board exam.
5. Performance in 10th becomes very critical for many students who have to change their schools or even change their location after 10th
6. Two other observations that were prominent were
7. ‘Smarter’ students opined that though board exams are theoretical in nature and did not serve any practical purpose, still they should be considered important and ‘Weaker’ students were willing to skip the exam and settle for internal examinations in-case provided with such an opportunity.
8. Like rural students urban students also talk about parental and peer pressure, interestingly they also say that pressure to show good performance is more because of ‘relatives and neighbours’ than because of parents

Parents’ Concern

1. Rural parents though are not much aware of their children’s academic abilities yet they attach a great importance to ‘board exams’ as these exams are conducted by ‘the government’ and the ‘pass certificate’ does carry value.
2. Apart from the aspirational value of getting their wards educated (which they themselves could not) they also opine that 10th pass boy has a better chance of getting a job, similarly many parents say a 10th pass girl has better prospects of getting married.
3. Surprisingly and contrary to the opinions of urban students, urban parents do feel that board exams do put a lot of pressure on students to perform. Parents are often found comparing their children with the children of neighbours, colleagues and relatives this adds to this anxiety.
4. Though many of the parents realise the tuitions do put undue pressure on the students, yet they do not stop their children from going for tuitions, for the fear of their children being left behind.
5. Few of the parents admit that absence of high stake examination like the board examination would make the children lazy and they would not take their studies seriously.
6. Both urban and rural parents consider these exams as ‘polestar’ for upper primary and secondary education, i.e. all actions of different stakeholders (students, parents and teachers) are aligned to the ‘big goal’ of attaining good marks in 10th.
Appendix 2: Discussions with Stakeholders: Teachers, Principals and Board Officials

Discussion 1

Shri S G Mankand, Gujarat Board Exam Reform committee, 2009

1. **Question Types:**
   - Questions which test memory and knowledge become meaningful, when properly framed. Such questions cannot be done away with and should be included.
     Example: What are the basic tenets of Buddhism? What are the functions of a liver?
   - The predictability of questions should be reduced.
   - Subjective questions (Essay types) are desirable as they can encourage active thinking and if other aspects (E.g. ‘predictability’) are taken care of, they would be difficult to be ‘taught’, thereby serving as true differentiators to determine the good learners among the various types of students.
   - All subjective questions should have a fair and detailed assessment rubric.
   - Questions which test writing skills (e.g. Write a proposal on how to conduct and manage an exhibition in your school .those which require creativity, logical thinking, problem solving, and/or analysis of case studies) should be included.
   - Questions which require argumentative and analysis skills should be included.
   - Questions from old and conventional patterns, e.g. ‘Precis Writing’, should be revisited.
   - Teachers lack the requisite skill to motivate students to learn with understanding, by understanding the logic and reasoning behind different topics and concepts. This is also reflected in the way some of these teachers make questions for the board exam question papers.

2. **Preparing a Balanced Question Paper:**
   - A single question paper which tests basic skills (E.g. the General Studies paper in Civil Service Examinations) has its own merits and may be considered.
   - The question papers may be of different skill levels, say Higher level, Standard level etc., and students may be given a choice to do either one or both of the papers.

3. **Examination:**
   - Exams need to be delinked from text books.
   - Introducing a credit system (wherein students require a certain number of credits to get the graduation certification) is worth looking at.
   - Another alternative would be to introduce the semester system for 9th and 10th standards, and have a whole basket of courses for the students to choose from.

4. **Transition Plan:**
   - Transition has to be gradual and could start at the grade 6 level.
   - Starting at grade 6 level would enable students to be ready for the reformed pattern in the next five years.
   - This would also reduce the opposition to the reformed pattern (if any) as the examinations at this level are of low stakes.
   - Teachers need to be prepared through extensive training not only on content matter but also on the right modes of evaluation down to choosing the questions.
5. Other Discussions:
- Assessments should have elements which encourage innate creativity (items related to the domains of arts, painting, poetry etc.) in students.
- IT /Technical skills should be considered as important as any core subject. Skills like Problem solving and Logical reasoning could be integrated into the assessments of IT /Technical skills.
- Students in Rural Gujarat should also have opportunities to avail IT and Technology.
- Online and On Demand examinations would be a good opportunity for students of different abilities to excel.

Discussion 2

A group of teachers of St. Xavier's School, Loyola, Ahmedabad

Teacher 1 profile:
Experience: More than 15 years of teaching experience
Subjects taught: History and Geography, Language
Classes taught: 9th and 10th

1. Need to Create a Common Credible Scale of ‘Level of Question Papers’: Firstly, a discussion on labelling a question paper in the examination ‘difficult’ or ‘easy’ itself is flawed. The opinions of students’ parents, their background and the intent of teachers decide the general opinions on the difficulty levels of exams. Secondly, the recent changes in the examination pattern are cosmetic. They would only change the perceptions not solve the real issues.

2. Elements of Good Assessments at the Board Level: A mix of internal and external assessments ought to be there. Internal assessments give the flexibility of incorporating ‘project work’, ‘case studies’ and ‘life skills’ into assessing the students. To ensure that internal assessments are not biased, external evaluators may be called in for the final evaluation of the internal assessment. External examinations should contain both objective and subjective types of questions. The quality of questions under these two broad types of questions needs to change. Assessment rubrics are a must for subjective questions.

3. Prioritising: Changing the pattern of question papers may not be fruitful unless teachers are equipped with the requisite skills. One suggestion was that there should be a subject specific handbook for ‘new teaching techniques’. Such text books should be updated periodically. It will be useful for teachers in both urban and rural schools. Parents should be counselled on the merits of the new pattern of assessments. Streaming of students should happen earlier than in the 10th Standard.

Teacher 2 profile
Experience: More than 10 Years of teaching experience
Subject taught: Business Administration and Accounts
Classes taught: 11th and 12th

1. The Role of the Government (Examination Board): The role of the government should be limited to designing a set of desired learning objectives. Examinations should be delinked from text books. Availability of a number of reference books is desirable. Test books should be updated more often than is being done currently (or example, chapters on Income Tax rules).
2. **Assessments**: For subjects with a wider application in different spheres of life (for example, business administration) assessments should include tests of academic, vocational and practical skills, in equal representation. Various skills which should be tested are presentation skills, interview skills, expressing opinions, writing dissertations, problem solving etc. Question papers should have a flexible pattern to ensure that the menace of tuition centres or rote learning of answers is eliminated.

3. **On Making Choices**: Streaming could be started a little earlier than 10th Standard. This could happen through an aptitude exam for different streams. Students should have more options in choosing subjects.

**Teacher 3 profile:**
*Experience: 5 Years of teaching experience*
*Subject taught: English*
*Classes taught: 10th, 11th and 12th*

1. **Challenges of Teaching English**: In general, there are two ways to look at language teaching and learning - one as a pure literature subject, secondly as a tool of communication. It should be taught, learned, and assessed in the same two perspectives. Unfortunately the current scheme of question papers and examination pattern does not allow either of the two to flourish. It is treated as ‘another subject’.

2. **Stream Specific Language skills**: There is a total lack of preparing the students for the future. For example, students aiming for a career in trade and commerce should have opportunities to learn and of course be assessed on the requisite skills. A component like ‘Financial literacy’ is greatly needed.

**Teacher 4 profile:**
*Experience: More than 5 Years of teaching experience*
*Subject taught: Mathematics*
*Classes taught: 9th and 10th*

1. **Issues with Assessments**: Analytical skills are not tested. Assessments are based entirely on the textbooks which make it difficult for analytical skills to be tested. The predictability of questions (say, probable questions) lowers the difficulty level of the questions. The quality of test items is often low; very direct questions taken as they are from the textbooks or from the papers of previous years is a common occurrence. Logical solutions to the questions are often discouraged.

2. **Opinions on the Examination System**: The credit system of examinations has a lot of merits. There should be options for students in choosing subjects. The idea of having different levels of papers is difficult to implement.
Discussion 3

Shri M M Pathan and his team (OSD, Secondary Examination Wing)

1. Infrastructure:
- There are more than 9000 schools with a total of 9 lakh students.
- Examination forms are distributed to schools through 42 distribution centres.
- These centres are ideally the nodal schools in different districts. Larger districts have more than one centre.
- The forms are collected and the data entry is done by different agencies.
- The data entries happen at three zones: (i) North Gujarat (ii) Central and South Gujarat (iii) Saurashtra and Kutch.
- Pre list (Preliminary list of hall tickets) is prepared and sent to schools for verification. Hall tickets are distributed through the three zones.
- Various sub processes include: Block building (1 Block = 30 Students); Creation of School Muster Centre Muster and District Muster; and Packing Memos (Number of Packets per school).

2. Key Challenges:
There are three key challenges: maintaining confidentiality, proper evaluation and timely declaration of results.

3. Evaluation Process:
- There are 190 centres.
- Each centre is assigned a subject and then the evaluators are selected.
- Evaluators are selected based on their experience and educational qualification.
- One answer paper is evaluated by a panel of four evaluators, (different evaluators evaluate different sections different sections). Model answers (keys) are given to the evaluators.
- Moderators recheck the evaluated answer papers based on pre-set criteria.

4. Questions and Question Paper Types:
- **On different levels of question papers:** It is feasible, but parents and teachers may have certain apprehensions. Decisions on the choice of subject and streams are usually taken by parents; so, it’s quite possible that only Higher Level papers are selected. It would be better if different levels of papers are implemented at the Senior Secondary level.
- **Other forms of assessments:** Portfolios, Case studies and School based assessments, though attractive from the ideation point of view, are difficult to implement.
- **Scientific nature of assessments:** Statistical tools are not utilised while making questions. There is no analysis of student performance on question papers or question items post evaluation, apart from reporting the marks scored. Teachers fail to make questions which test the ‘application of knowledge’.
Discussion 4

Mr. Hasmukh Hingu, Ex. Chairman of the GSHSEB (2004-06)

1. Issues of Teachers: Teachers are not taken into confidence when the changes are proposed. The quality of teaching and learning is affected due to large classes. Many teachers do not participate actively in teaching and assessing due to possible political interference. At times, policy makers tend to have diverse opinions on ‘the needs’ at the ground level.

2. Issue of Awareness: Parents are major stakeholders. The more we educate them about the logic behind these changes, the more are our chances of success.

3. Reforms in 2004: The question paper pattern was changed in 2004. Prior to 2004, only 40% students of Science stream passed the exams even with grace marks. The subsequent changes led to an increased pass percentage of 80% and also to an increase in the number of students appearing for science stream exams from about 40-45 thousand to 115 thousand.
   - Preliminary steps: Three major steps taken were: i. Rewriting of text books; ii. Conduction of mock tests; and iii. Training of 200 teachers on setting the question paper. NCERT provided the said training.
   - Changes in blue print: Three guiding principles of the reformed question paper pattern were: (i) questions should assess students on ‘what they know’ and not on ‘what they would not know’, (ii) questions should be short and precise (iii) the weightage of marks should be allotted for question types and not for chapters.
   - Changes in selection of examiners: Prior to 2004, the examiners were selected from a master list maintained by the board. Post 2004, screening norms were set and examiners were also interviewed.
   - New system of checking the papers: Under the new system, different evaluators assess different sections. These marks are then verified moderated by a single moderator to ensure uniformity.

4. Suggestion for a question bank: A question bank containing questions from the papers of past 10 years and possibly covering questions from the entire syllabus should be prepared. The possibility of questions being repeated could be eliminated by sensitizing the moderators (for question paper setting).

5. Remuneration for the paper setters: The remunerations have been rising steadily. From approx. Rs. 500/- per paper in 2004, it has increased to Rs. 2000/- at present.

Discussion 5

Mr. Mahesh I Joshi, Secretary, GSHSEB

1. Skill of Teachers: Teachers lack the requisite skill to motivate students to learn with understanding, by understanding the logic and reasoning behind different topics and concepts. This is also reflected in the way some of these teachers make questions for the board exam question papers.
2. Preparing a Balanced Question Paper: Gujarat Secondary and Higher Secondary Examination Board (GSHSEB) defines a balanced question paper as one which maps to the pre decided blue print. In general a sound scientific rationale for a balanced question paper has not been discussed.

3. Managing the ‘Examination Cycle’: The Examination Cycle – revision of text books, drafting of the blue print, selection of the questions, setting of the paper, conduction of the exams, and preparation of the results - is a long drawn process. Managing each of these steps within the allotted duration and ensuring the desired quality is one of the major challenges.

4. Attitude of Parents: One of the bottle necks in the process of quality question setting is the attitude of parents and students. A majority of the parents and students oppose questions ‘out of the text books’, even though such questions test the same basic concepts. Introduction of application based question may also be similarly opposed.

5. Definition of a Good Quality Question: A good quality question is one which an average student is able to read and answer as per the expectations of the question paper.

6. Possibility of Using Statistical Tools: A post analysis of question quality using standard statistical tools is not a bad idea and can be possibly attempted in the future.

7. Minimum Level of Learning: Students should be certified with a ‘minimum level of learning’; market forces would determine the direction of their professional development and their ultimate capability.

8. Idea of a Question Bank: Having a question bank of ‘quality questions’ would help in reducing the dependency on teachers for every exam cycle and in maintaining the confidentiality of the question papers.

Discussion 6

Mrs. Seema, Teacher (Biology, Grades 9-12), St. Xavier’s (Jamnagar)

1. Issues with the Present Question Pattern: Multiple choice questions are not good differentiators between students of different abilities. The increase in number of multiple choice questions has led to ‘mass copying’. Even the subjective questions are asked directly from the text book. These questions lack depth and quality. Those who set the question papers follow the procedures mechanically for fear of ‘action’, even in cases of genuine ‘human errors’.

2. Opinion on Different Levels of Question Papers: Students and their parents would be hesitant to opt for a ‘standard level paper’ instead of ‘higher level paper’. The fears of being branded as ‘less intelligent’, getting ‘lesser opportunities in future’, etc.. are some of the factors which lead to such thinking.

3. Internal Assessment: The proposed internal assessments need to be standardised. Evaluations based on the teachers’ perceptions would lead to skewed marking, in favour of few students.
4. Other Forms of Assessments: Assessment forms like portfolios and projects merit attention but the flip side of it is that such tasks are more often than not the students’ own creations as seeking help from parents, siblings and teachers is considered acceptable. But these tasks are often done entirely by the parents themselves or are available through various agencies.

5. CCE as a Solution: Multiple and periodic tests as envisaged in CCE of CBSE have their own advantages. However, the teachers should be given the autonomy in deciding the number as well as the kind of tests the students need to take for their course.

6. Other Recommendations: A good quality question paper should contain at least 20% higher order questions. Questions based on ‘real life application’ are highly desirable.

Discussion 7

Mr. Ansari, Teacher (Physics, Grades 9-12), St. Xavier's (Jamnagar)

1. Evaluation: Most of the time, evaluators are not provided the right environment. They are often paid very less (Rs. 3 per paper). Even the best of evaluators are not able to assess more than 40-50 papers in a day. Evaluation work is often a forced duty; naturally, the quality of work is shoddy.

2. Paper Setting: Questions do not match the stated blueprint. Questions are of very low quality. The question papers are set in such a way that even if the student does not know 20-30% of the content, he/she can still score reasonably good marks.

Discussion 8

Mrs. Harsha, Teacher (English, SS Grades 9-12), St. Xavier's (Jamnagar)

1. Number of Multiple Choice Questions (MCQs) should be reduced.

2. Language papers should include questions which tests ‘writing ability’. The current trend of assessing students on familiar topics should be done away with. Students should be tested on their ability to showcase their vocabulary and command over the language by writing on unfamiliar, newer titles.

3. Assessment of Social Studies: In order to have a rational and contextual assessment in Social Studies, the board should provide teachers and students with a larger number of reference books. Students should be assessed on larger number of topics; one way to do that is including topics from both 9th and 10th Standard syllabi.

4. Gradual Introduction: Quality of assessments has to be increased gradually; for this purpose, better methods of teaching and assessment have to be introduced from lower classes.
5. Evidence of Malpractice: The examination process gives many opportunities for irregularities. The evaluators can easily make out the ‘use of malpractices’ of copying from others, writing down dictated answers etc., from one glance at the answer sheet.

Discussion 9

Mr. and Mrs. Saju, Parent (10th and 9th class students)

1. Positive Change: A new pattern of the question paper including MCQ, Very Short Answer, Short Answer, and Long Answer type of questions is a good beginning. Students can get an overall idea of their abilities; so can parents. Weak students can also have the ‘satisfaction’ of being able to solve relatively easier sections.

2. In the Short Term: Some aspects of assessments could be improved - MCQs can have a variety of difficulty levels; the section on subjective questions can have a richer variety of in-depth questions.

3. As a Long Term Measure: The assessments need to prepare the students for the future;, contextual learning and testing are very critical if students are to excel in their chosen careers.

4. Subject Specific Improvements: Students should be tested on a range of writing skills; the current practice of having a ‘select few topics’ and asking students to write ‘an essay’ should be abolished. Students should asked questions on basic local geography and modern history; this will not only be a check of their contemporary knowledge but will also prove to be an asset for them in the future.

5. Three key issues which need to be addressed are: (i) equipping the institutions to deliver quality education; (ii) managing aspirations of the parents; and (iii) training the teachers.

Discussion 10

Mr. Pankaj Chawda, Teacher, Evaluator, Text book writer (Physics)

1. What are we assessing? Acquisition of cognitive skills is classified into (i) Visionary, (ii) Kinaesthetic and (iii) Auditory. A good assessment should provide opportunities to three types of learners to exhibit their skills. The current assessments (written examinations) are therefore mediocre.

2. Quality of Board examination papers: The question papers are full of (i) absurd questions (e.g. asking number of stars) and (ii) questions, which need dynamic information (e.g. who ranks number one in rice production in the world). These question papers have very less number of application based questions.

3. Challenges in proposing the new system:
   - Any recommendations on proposing assessments which are meaningful should include a recommendation for training the teachers. A majority of teachers are lack basic knowledge
of subject matter. In addition to this teachers are saddled with a class size of 70-80 students, this when compared to ‘top performing’ countries is fairly large. It becomes difficult for teachers to impart quality lessons.

- If the assessments at 10th/12th level are made skill based, understanding based, than ideally the admission norms for universities/colleges should be restructured accordingly. Colleges and Universities should assess students on their ‘readiness’, ‘core skills’ and ‘general aptitude’ before granting them admissions. Grades obtained in the qualifying exam could just be one of the criterions.

- Any change in the difficulty level or improvement in quality of questions is generally met with a huge backlash from parents, probably due to the fact that they are aware of the consequences of scoring lower grades, their fears are not completely unjustified- even best of institutions like IIM B, give a considerable weightage to marks obtained in Class 10th. Awareness among parents is therefore very critical.

Discussion 11

Mr. G A Pathak, Director, H. L. Centre for Professional Education

1. Quality of College Students: New college entrants do not have skills proportionate to their age and maturity levels. They are not clear about the fundamental concepts.

2. Examination: Results of the examinations (Board exams) are not a reflection of the students’ abilities. These results are ‘mere certificates’ for obtaining admission to a college.

3. Quality of Board Examinations: Two aspects of examinations are ‘receptivity’ and ‘reflection’. Receptivity leads to internalisation of learned concepts. Reflection, at times may translate into ‘rote’ presentation of facts. Current examinations test only reflection.

4. Examination Pressure: Quality of questions asked in the examinations adds to the anxiety of students. Ambiguous questioning styles such as ‘write a short note on...’ do not require students to use their intellect; they end up reproducing the facts the crammed into their memory. When we compare such questions with those asked in SAT/ACT exams (US), we find that the latter are conceptual and are true reflections of the students’ abilities. Importance of private tutoring has increased to such an extent that ‘tuition classes’ have more attendance than ‘regular classes’ in schools. The obsession with more and more marks has added to the pressure.

5. Government’s Efforts: Probably the government is taking the right steps in terms of educational reforms. But these steps need to be made more intense and have to be sustained for a longer time period.

6. Possible Solutions: We need to think about long term solutions than quick fix solutions. Firstly, if we hope to prepare students for professional careers – we would need to hire ‘better skilled ‘teachers at every level. Secondly, we ought to have a ‘pool of model schools’ – these schools should act as benchmarks for students and teachers alike.
Discussion 12

**Mrs. Urmila Shah, Coordinator, Sharda Mandir School**

1. Two important purposes an examination should serve are: to inculcate independent thinking and to promote free expression of thoughts. Present examinations fail to deliver either of these.

2. Teachers and administrators are no longer the ‘decision makers’ in their own classrooms and schools. The ability to take ‘risk’ has diminished.

3. Introduction of MCQs in the Class 10 Board exam and that of the semester system in other classes reflect the acceptance of ‘mediocrity’.

4. Neither the students nor their parents are ‘willing to work hard’. Motivation and goal setting are completely absent amongst students, teachers and parents. Parents also contribute to the students’ phobia of examinations.

5. ‘Escapism’ is the best word to describe the mindsets of all stakeholders.

6. Advocacy for quality in content is perhaps a solution. Parents need to be counselled and educated.

Discussion 13

**Mr Jayesh Bhai, Parent of a 10th Standard student.**

1. **Lot of Examinations:** Introduction of Board exams in classes 10, 11 and 12 are perhaps overwhelming. Students do not know when exams have ended and when they would need to start preparing for the next cycle.

2. **Comments on the New Pattern:** Every student gets to ‘do something’ – perhaps, it is fair on the weaker students. Introduction of MCQs also means that students have more time at their hand to answer the other sections.

3. **Tutions:** Parents are left with little options other than sending their wards for ‘private tuitions’. Time and efforts put in by the teachers in schools is not sufficient.

Discussion 14

**Mr. Kalpak Kothari, Eminent Educationist**

1. **Issues of Quality:** Firstly, teachers lack a foundational knowledge of their subjects and related basic skills. Secondly, lack of proper training on question making and paper setting also contributes to the lowering of quality. Adequate deliberations do not take place on question papers resulting in the inclusion of many’, ‘rote and straight recall questions’. Some questions are taken from the text books as they are.
2. **Positive Step:** Introduction of more number of MCQs in the question papers is a positive step. The overall quality of the questions needs to be strengthened in terms of framing the question stem, providing more discerning options, contextualising the question, ensuring a link to the real life, etc.

* A body slides down an inclined plain..... : A difficult thing to imagine
* A boy slides down a slide ... : A real question – easily imaginable

3. **Time Allocation:** Time allocation affects the question maker and students alike. In general in order to make a quality question it would take more time. A quality question takes its final shape through a number of iterations and commenting, whereas an average or a below average question is most commonly taken from the textbook as it is or is very often a repeated question. Such questions are repeated either in entirety or with the values changed. Even under the present examination scheme, the time allocated for answering the questions is not sufficient. If students are to think and write quality answers they should have the liberty to do so’.

4. **Reasons for a Lack of Quality Questions:** There is a ‘lack of motivation’ amongst the teachers to actively participate in the question making process. Apathy of the system (the administrators and the general public) towards the teachers and their general standing in the educational hierarchy is contributing to this de-motivation. Apart from all these, there is no ‘additional’ incentive for teachers to make quality questions, Mediocrity is acceptable.

5. **Recommendations:**
   - Create an online question bank wherein teachers can make quality questions and let this be a continuous process. The Board can keep their own moderators and approvers for such questions. Every approved question can be recognised or incentivised. The Board can release a set of topics on which questions need to be made and the teachers can send their questions by post or post them online itself.
   - Create a platform for ‘idea exchange’. Let educational debates happen. Workshops, teacher conventions, subject specific idea sharing, etc should be encouraged. All such discussions should be focussed.

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**Discussion 15**

**Mr. G M Rabari, Exam Secretary, GSHSEB**

1. The Board is positive about reforming the existing examination system for better. The fact that a lot of work has been done to change the overall structure and the question paper pattern corroborates this statement. The collaboration with NCERT a few years back has led to qualitative changes in the question papers.

2. A number of steps are being taken under the current series of reforms. Project ‘C’ is one of the challenging projects.

3. GSHSEB is looking forward to the outcomes and recommendations of research work assigned to Educational Initiatives under Project ‘C’.
Discussion 16

Mr. G M Rupareliya, Research, GSHSEB

1. Assessment and content reform has to run parallel to each other.

2. Increase in the number of MCQ questions help weaker students to score more marks but this system will not be beneficial in the long run (especially in terms of the employability of these students).

3. Improvement in the quality of questions or introducing contextual, real life application questions cannot happen unless we have adequate resources to produce such questions.

Discussion 17

Mr. V D Chawda, SS teacher, 11 years, Janmbhumi High School, Ranpur

1. A large number of MCQ questions have made the question paper very easy. This has also contributed to malpractices like cheating and copying. Some of the students have stopped working hard. The number of MCQ questions should be reduced to 20-25 instead of 50, in a paper.

2. In the Social Studies papers, questions which test practical skills like map work should be given greater weightage.

3. Increasing the pass percentage of the students by lowering the quality of questions cannot be the right solutions.

4. Those who set the papers have to adhere to the blue print provided to them by the Board. The blue print is at times ambiguous and not clear.

5. The quality of question papers should be gradually enhanced from the lower grades.

6. The question papers should be made more appealing to the students with images and illustrations.

Discussion 18

Mr. Kanak Dodiya, Mat teacher, 6 years, Janmbhumi High School, Ranpur

1. The number of topics to be covered is large. The teaching months are effectively from June to December. Therefore the teachers and students have very little time to concentrate on the qualitative aspects.

2. The overall quality of questions is ok. Number of MCQs should be decreased.
Discussion 19

1. Open School and Regular School students should have separate examination arrangements.

2. Students opting for technical education or further research based studies should be accessed through external exams (like the current Board exam) while the other students who do not wish to pursue such courses should be assessed internally.

3. English and Math are two subjects which need special attention from the teachers and the decision makers.

4. Students should be also assessed through a Board exam at the end of their ‘primary schooling’; this will give a fair picture of their readiness for secondary education. This also helps to fix accountability. This exam need not be of high stakes.

Discussion 20

1. Schools, students, teachers and parents are finding it difficult to cope with some rapid changes in the system of examinations in the last few years.

2. The examination systems in classes 8th (Annual), 9th (Semester) and 10th (Board) are entirely different. Students are having a difficult time in getting accustomed to three different systems.

3. CCE is perhaps a good way of evaluating students. No doubt, it increases the work load.

Appendix 3: Time Line for Transition

Mrs. Shalini Mahto, Principal, Blue Bells School, Ambawadi, Ahmedabad
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Building Teacher Capacity</strong></td>
<td>Jun/July: Dissemination campaign on PISA.</td>
<td>Feb/March: Creating a bank of video materials and courses in Gujarati</td>
<td>Throughout the year: (Can be Biannual or quarterly competitions)</td>
<td>Throughout the year: Training Calendar can be made as per administrative feasibility)</td>
<td>Training programme for teachers on ‘how to teach, how teaching should change’.</td>
</tr>
<tr>
<td></td>
<td>Aug/Sep: Annual/Biannual workshops on ‘Teaching for understanding’.</td>
<td>Aug/Sep: Translate TIMSS Videos into Gujarati and make the available to teachers and principals.</td>
<td>Organise activities and competition which encourage teacher to think and be creative</td>
<td>Organise these could include question making competition, activity based competitions etc.</td>
<td>The winners can be showcased and rewarded.</td>
</tr>
<tr>
<td></td>
<td>Oct/Nov: In-depth analysis of TIMSS Videos</td>
<td>Apr/May: Large scale training of Teachers towards teaching for understanding, developing good questions, differentiating between mechanical and conceptual learning.</td>
<td>Apr/May: These could include question making competition, activity based competitions etc.</td>
<td>Apr/May: These could include question making competition, activity based competitions etc.</td>
<td>The winners can be showcased and rewarded.</td>
</tr>
<tr>
<td></td>
<td>Dec/Jan: Designing courses with external agencies (like EI)</td>
<td>July/Aug: Introduce a ‘Teacher magazine’.</td>
<td>July/Aug: These could include question making competition, activity based competitions etc.</td>
<td>July/Aug: These could include question making competition, activity based competitions etc.</td>
<td>The winners can be showcased and rewarded.</td>
</tr>
<tr>
<td><strong>Question and Paper Setting and removing errors</strong></td>
<td>June/July/Aug: Consult Experts and Education boards in India and abroad Partner with an external agency to train a ‘core group’ of setters among the larger pool to set paper (for next 4 years)</td>
<td>Aug/Sep: Workshop on making effective questions</td>
<td>Aug/Sep: Course on Assembling a good paper</td>
<td>Aug/Sep: Course on Correcting subjective questions – Marking r</td>
<td>Aug/Sep: Trial run of Paper setting by the core group</td>
</tr>
<tr>
<td></td>
<td>Sep/Oct: Train Paper setters (large pool) and identify a core group for setters.</td>
<td>Sep/Oct: Course on Understanding studies like TIMSS and PISA</td>
<td>Sep/Oct: An introductory course to modern psychometric methods like IRT and Scale Anchoring</td>
<td>Oct/Nov: Concepts of Bloom’s Taxonomy and Blended Learning</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nov/Dec: Course on Differentiating between Mechanical and Conceptual Learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Making</strong></td>
<td>July/Aug:</td>
<td>Mar/Apr:</td>
<td>Mar/Apr:</td>
<td>Mar/Apr:</td>
<td>Mar/Apr:</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Students ready</td>
<td>Gunotsav with TIMSS /PISA type questions – Grade 9 and Grade 10</td>
<td>5% board exam to be contain thinking based questions.</td>
<td>One Summative Assessment from Board: Grade 7 - Math, ST. Grade 6 –Math</td>
<td>25% board exam to be contain thinking based questions.</td>
<td>45% board exam to be contain thinking based questions</td>
</tr>
<tr>
<td>Aug/Sep:</td>
<td>ASSET type Low stake Exam: Grade 5</td>
<td>One Summative Assessment from Board : Grade 6 – Math</td>
<td>One Summative Assessment from Board: Grade 8 - Math, ST, SS Grade 7 - Math, ST Grade 6 –Math</td>
<td>One Summative Assessment from Board: Grade 9 and Grade 10</td>
<td></td>
</tr>
<tr>
<td>Nov/Dec:</td>
<td>Scholarship test for Grade 5</td>
<td>July/Aug: Gunotsav with TIMSS /PISA type questions – Grade 9 and Grade 10</td>
<td>July/Aug: Gunotsav with TIMSS /PISA type questions – Grade 9 and Grade 10</td>
<td>July/Aug: Gunotsav with TIMSS /PISA type questions – Grade 9 and Grade 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aug/Sep: ASSET type Low stake Exam: Grade 6,Grade 5</td>
<td>Aug/Sep: ASSET type Low stake Exam: G8,G7,G6,G5</td>
<td>Aug/Sep:</td>
<td></td>
</tr>
</tbody>
</table>

**Paper Correction**

| Sep/Oct: | Workshop on making effective questions |
| Oct/Nov | Workshop on making good MCQ questions |
| Nov/Dec | Different types of questions and their uses |

**Awareness and Mindsets**

| Jan/Feb: | Commission/ Publish a book on 'Learning with Understanding'. |
| October: | Throughout the year: Public lecture series/discussions on topics related to education (teaching and learning gaps) |
| July/Aug: | Principal and Teacher Seminars |

**Throughout the year:**

- Prepare and show short films on why these changes are necessary.
- Campaigns to involve parents (TV shows simple tests provided in newspapers, websites that parents can do themselves)
<table>
<thead>
<tr>
<th>Board Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constitute an Advisory Council</td>
</tr>
<tr>
<td>Form a special Transition Cell in the Board</td>
</tr>
<tr>
<td><strong>July/Aug</strong> Form a larger Task Force which will include some teachers and experts</td>
</tr>
<tr>
<td><strong>Sep/Oct</strong> Constitute a Technical Support Programme.</td>
</tr>
<tr>
<td>Announce Percentiles with Board Results</td>
</tr>
<tr>
<td><strong>July/August:</strong> Publish an assessment Book (with analysis of student answers post Board Exams).</td>
</tr>
<tr>
<td><strong>Monthly brain Storming:</strong> Training and discussion in the Board itself to get their buy-in</td>
</tr>
<tr>
<td>Board to Publish Post-assessment Analysis of test papers</td>
</tr>
<tr>
<td><strong>Throughout the year with year and as the target:</strong> setting up Board depts.: Psychometrics, E-learning,</td>
</tr>
<tr>
<td><strong>year with year and as the target:</strong> Board to publish test papers of exams from specific countries with which there are tie-ups.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Board to bid for other projects</td>
</tr>
</tbody>
</table>
Appendix 4: Assessments Rubrics

1. TIMSS: Writing Constructed-response Items and Scoring Guides

For some desired outcomes of mathematics and science education, constructed-response items provide more valid measures of achievement than do multiple-choice items. The quality of constructed-response items depends largely on the ability of scorers to assign scores consistently and reliably within and across countries. Thus, it is essential that each constructed-response item and its scoring guide be developed together.

PLEASE keep the guidelines for writing constructed-response questions in mind. In particular, ask a clear question, and develop a scoring guide for the question at the same time as the question is developed.

Constructed-response items usually require students to give a numerical result, provide a short explanation or description given in one or two phrases or sentences, complete a table, or provide a sketch. They are scored as either 1 or 2 points for fully-correct answers.

- 1-point constructed-response items are scored as correct (1 score point) or incorrect (0 score points).
- 2-point constructed-response items are scored as fully correct (2 score points), partially correct (1 score point), or incorrect (0 score points). For example, a response demonstrating thorough understanding of concepts and processes will receive full credit (2-points). These responses show a complete or deeper understanding than a response that will receive partial credit (1-point). (Developing scoring guides is explained in the next section.)

Grade 8 mathematics item (1 point):

<table>
<thead>
<tr>
<th>Code</th>
<th>Response</th>
<th>Item: M042263</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10 zeds and equation(s) shown. Equations should involve the use of letter(s) as variable(s), e.g., $2y + 3x = 17$.</td>
<td>Correct Response</td>
</tr>
<tr>
<td>11</td>
<td>10 zeds and other work shown, e.g., pen = pencil + 1</td>
<td>Correct Response</td>
</tr>
<tr>
<td>70</td>
<td>10 zeds, no work shown</td>
<td>Incorrect Response</td>
</tr>
<tr>
<td>79</td>
<td>Other incorrect (including crossed out, erased, stray marks, illegible, or off task)</td>
<td>Incorrect Response</td>
</tr>
<tr>
<td>99</td>
<td>Blank</td>
<td>Non-response</td>
</tr>
</tbody>
</table>
Grade 8 science item (2 points):

The diagram shows what happens to three magnets when they are placed close together on a pencil.
Magnets X and Y move until they touch each other, but magnets Y and Z remain separated.

1. Explain why magnets X and Y touch each other.

2. Explain why magnets Y and Z remain separated.

<table>
<thead>
<tr>
<th>Code</th>
<th>Response</th>
<th>Item: M042263</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Correct Response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Refers to unlike poles (NS or SN) AND like poles (NN or SS). Attraction and repulsion may or may not be mentioned.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Magnets X and Y touch each other because the north and south poles were facing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Magnets Y and Z remain separated because they may have had south and south or north and north facing each other.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Magnets X and Y attract each other as they have unlike poles facing each other.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Magnets Y and Z repel as they have like poles facing each other.</td>
<td></td>
</tr>
<tr>
<td><strong>Partially Correct Response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Refers to unlike poles (NS or SN) OR like poles (NN or SS). Attraction and repulsion may or may not be mentioned.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Side Y is facing side X (incorrect).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The side of Y facing Z has the same, e.g. south and south (correct).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Magnets X and Y attract because they aren't the same (correct).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Magnets Y and Z remain separated because they are north and south (incorrect).</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Mentions attraction and/or repulsion but does not explain why.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Magnets X and Y touch each other because the magnetic forces pull the magnets together.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Magnets Y and Z remain separated because the magnetic forces push apart.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Magnets X and Y touch each other because specific sides of a magnet attract.</td>
<td></td>
</tr>
<tr>
<td><strong>Incorrect Response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Responses reverse the the poles (i.e., like poles attract and unlike poles repel).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Magnets X and Y touched together because they found south and south together.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Magnets Y and Z remained separate because they were north and south.</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Responses refer to negative and positive sides.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Magnets X and Y have opposite sides that faced each other so they connected.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Magnets Y and Z have the same side, either negative or positive facing each other so they didn’t connect.</td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>Other incorrect (including crossed out, erased, stray marks, illegible, or off task)</td>
<td></td>
</tr>
<tr>
<td><strong>No response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>Blank</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** If the diagram is correctly labelled with N and S, but the explanation is minimal or not provided, code as 20.
MARKSCHEME

May 2008

MATHEMATICS

Higher Level

Paper 1

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Instructions to Examiners

Abbreviations:
- M: Marks awarded for attempting to use a correct Method; working must be seen.
- (M): Marks awarded for Method; may be implied by correct subsequent working.
- A: Marks awarded for an Answer or for Accuracy; often dependent on preceding M marks.
- (A): Marks awarded for an Answer or for Accuracy; may be implied by correct subsequent working.
- R: Marks awarded for clear Reasoning.
- N: Marks awarded for correct answers if no working shown.
- AG: Answer given in the question and no marks are awarded.

Using the mark scheme:

1. General
   - Write the marks in red on candidates' scripts, in the right hand margin.
   - Show the breakdown of individual marks awarded using the abbreviations M1, A1, etc.
   - Write down the total for each question (at the end of the question) and circle it.

2. Method and Answer/Accuracy marks:
   - Do not automatically award full marks for a correct answer; all working must be checked, and marks awarded according to the markscheme.
   - It is not possible to award M9 followed by A1 to A mark(s) depend on the preceding M mark(s), if any.
   - Where M and A marks are noted on the same line, e.g. M1A1, this usually means M1 for an attempt to use an appropriate method (e.g., substitution into a formula) and A1 for using the correct values.
   - Where the markscheme specifies (M2), N3, etc., do not split the marks.
   - Once a correct answer to a question or part-question is seen, ignore further working.

3. N marks:
   - Award N marks for correct answers where there is no working.
   - Do not award a mixture of N and other marks.
   - There may be fewer N marks available than the total of M, A and R marks; this is deliberate as it penalizes candidates for not following the instruction to show their working.

4. Implied marks:
   - Implied marks appear in brackets e.g., (M1), and can only be awarded if correct work is seen or if implied in subsequent working.
   - Normally the correct work is seen or implied in the next line.
   - Marks without brackets can only be awarded for work that is seen.

5. Follow through marks:
   - Follow through (FT) marks are awarded where an incorrect answer from one part of a question is used correctly in subsequent part(s). To award FT marks, there must be working present and not just a final answer based on an incorrect answer to a previous part.
   - If the question becomes much simpler because of an error than use discretion to award fewer FT marks.
   - If the error leads to an inappropriate value (e.g., sinθ = 1.5), do not award the mark(s) for the final answer(s).
   - Within a question part, once an error is made, no further dependent A marks can be awarded, but M marks may be awarded if appropriate.
   - Exceptions to this rule will be explicitly noted on the mark scheme.

6. Mis-read
   - If a candidate incorrectly copies information from the question, this is a mis-read (MR). Apply a MR penalty of 1 mark to that question. Award the marks as usual and then write −1(MR) next to the total. Subtract 1 mark from the total for the question. A candidate should be penalized only once for a particular mis-read.
   - If the question becomes much simpler because of the MR, then use discretion to award fewer marks.
   - If the MR leads to an inappropriate value (e.g., sinθ = 1.5), do not award the mark(s) for the final answer(s).

7. Discretionary marks (d)
   - An examiner uses discretion to award a mark on the rare occasions when the mark scheme does not cover the work seen. The mark should be labelled (d) and a brief note written next to the mark explaining this decision.

8. Alternative method:
   - Candidates will sometimes use methods other than those in the mark scheme. Unless the question specifies a method, other correct methods should be marked in line with the markscheme. If in doubt, contact your team leader for advice.
   - Alternative methods for complete questions are indicated by METHOD 1, METHOD 2, etc.
   - Alternative solutions for part-questions are indicated by EITHER ... OR.
   - Where possible, alignment will also be used to assist examiners in identifying where these alternatives start and finish.
9 Alternative forms:

Unless the question specifies otherwise, accept equivalent forms.
- As this is an international examination, accept all alternative forms of notation.
- In the mark schemes, equivalent numerical and algebraic forms will generally be written in brackets immediately following the answer.
- In the mark schemes, simplified answers, (which candidates often do not write in examinations), will generally appear in brackets. Marks should be awarded for either the form preceding the bracket or the form in brackets (if it is seen).

Example: for differentiating \( f(x) = 2 \sin(3x - 3) \), the mark scheme gives:
\[
f'(x) = (2 \cos(3x - 3)) \cdot 3 = 6 \cos(3x - 3)
\]

Award A1 for \((2 \cos(3x - 3)) \cdot 3\), even if \(10 \cos(3x - 3)\) is not seen.

10 Accuracy of Answers

If the level of accuracy is specified in the question, a mark will be allocated for giving the answer to the required accuracy.
- Rounding errors: only applies to final answers not to intermediate steps.
- Level of accuracy: when this is not specified in the question the general rule applies: unless otherwise stated in the question all numerical answers must be given exactly or correct to three significant figures.

Candidates should be penalized once only IN THE PAPER for an accuracy error (AP). Award the marks as usual then write (AP) against the answer. On the front cover write +1(AP). Deduct 1 mark from the total for the paper, not the question.
- If a final correct answer is incorrectly rounded, apply the AP.
- If the level of accuracy is not specified in the question, apply the AP for correct answers not given to three significant figures.

If there is no working shown, and answers are given to the correct two significant figures, apply the AP. However, do not accept answers to one significant figure without working.

11 Crossed out work

If a candidate has drawn a line through work on their examination script, or in some other way crossed out their work, do not award any marks for that work.

1. **METHOD 1**

\[ r = 2, \quad \theta = \frac{\pi}{3} \quad \text{(A1) (A1)} \]
\[ \therefore (\sqrt{3} + \sqrt{3} \cos \theta + i \sqrt{3} \sin \theta)^2 = (\sqrt{3} + 1)^2 \]
\[ = \frac{1}{2} (\cos \pi + i \sin \pi) \quad \text{(M1)} \]
\[ = -1 \quad \text{(A1)} \]

**METHOD 2**

\[ (1 - \sqrt{3}i)(1 + \sqrt{3}i) = 1 - 3i + 3i = 4 \quad \text{(M1) A1} \]
\[ (1 - 2i)(1 + 2i) = 5 \quad \text{(M1) (A1)} \]
\[ \therefore \frac{1}{1 - 3i} = -1 \quad \text{(A1)} \]

**METHOD 3**

Attempt at Binomial expansion
\[ (1 - \sqrt{3}i)^3 = 1 + 3(-\sqrt{3}i) + 3(-\sqrt{3}i)^2 \]
\[ = -1 - 3\sqrt{3}i - 9 \quad \text{(A1)} \]
\[ = -10 - 3\sqrt{3}i \quad \text{(M1) A1} \]
\[ \therefore \frac{1}{1 - \sqrt{3}i} = -1 \quad \text{(M1)} \]

2. If \( M \) is singular, then \( \det M = 0 \)

\[
\begin{vmatrix}
M &=& a & 1 \\
-1 & a & 2a & 0 & 1 \\
0 & -1 & a
\end{vmatrix}
\]

\[ = a(a^2 - 1) - 2a(-a^2 - a) \quad \text{(M1)} \]
\[ = a(a^2 + 1) - 2a(-a^2 - a) \quad \text{(A1)} \]
\[ = a = 0, \quad a = 1, \quad a = -1 \quad \text{A1 A1 A1 A1} \]

[6 marks]
MARKING NOTES
REMARQUES POUR LA NOTATION
NOTAS PARA LA CORRECCIÓN

May / mai / mayo 2008

ENGLISH / ANGLAIS / INGLÉS A1

Higher Level
Niveau Supérieur
Nivel Superior

Paper / Épreuve / Prueba 1

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http://www.xtremepapers.net
Provisional marking

During the early period of your marking your team leader (or principal examiner in the case of team leaders) will contact you to discuss the standard of marking and the interpretation of the marking notes. Before this discussion, it is necessary to have provisionally marked (in pencil) about ten scripts.

If your team leader has failed to make contact with you, please try to make contact with him or her yourself, by phone or e-mail.

ASSESSMENT CRITERIA

Criteria A and B

The danger of rewarding or penalizing the use of illustration/references/quotations twice in both these categories should be avoided.

Criterion B

The passages for commentary offer candidates a variety of possibilities for analysis and interpretation. The text of any interpretation is that it has to be tied carefully to the words, images and relevant details of the text. Personal response, in the same way, must be tied to the passage.

In the descriptor for level 3, there may be other conditions under which a "3" may be awarded, such as a limited use of evidence or a generally weak response. Substantiation of points may be made but be very weak/superficial.

What is sought by "personal response" is an individual voice and engagement with how the text works. Engaged and individual commentaries will usually make themselves clear by the depth of insight into the text and the quality and interest of the details cited in support.

The first person singular does not automatically constitute a personal response and conversely an impersonal academic style does not necessarily indicate a lack of personal response.

Criterion C

"Awareness" and "appreciation" of literary features are the key elements under this criterion. The mere labelling, without appreciation, of literary features will not score the highest marks. On the other hand, the candidate who is attentive to literary features and deals with them in a meaningful way, but who does not consistently use the vocabulary of literary criticism, can still be awarded the higher achievement levels.

Reminder: the term "literary features" is broad and includes elements as basic as plot, character etc., attention to which is valid and must be rewarded as appropriate.

Criterion D

Any form of structuring to the commentary will be rewarded if it is effective and appropriate. Different conventions are in operation and therefore all approaches (including the linear, line by line analysis) are acceptable and will be judged on the basis of their effectiveness. Examiners should remember that structure does not exist by itself, but any structure must be measured by appropriate reference to the passage or poem and by its capacity to integrate these towards the development of an organized and coherent commentary.

Reminder: In this criterion, supporting examples must be evaluated in terms of how fluently they are incorporated/integrated to shape/advance the argument, not in terms of their appropriateness or accuracy.

Criterion E

If you have reservations about awarding a four, you should ensure that these are well founded before awarding a three. The breadth of achievement in level three sometimes makes examiners reluctant to award four.

Use judgement when dealing with lapses in grammar, spelling and punctuation: therefore do not unduly penalize.

Mechanical accuracy is only a part of this criterion. Ensure that all the other elements are considered.

Examiners should be careful to avoid being prejudiced in their application of this criterion by achievement levels in other criteria. It is possible to score highly on this criterion even if candidates have scored in the lower levels on the other criteria, and vice versa.

These notes to examiners are intended only as guidelines to assist marking and as a supplement to the published external assessment criteria for written paper 1. They are not offered as an exhaustive and fixed set of responses or approaches to which all answers must rigidly adhere. Good ideas or angles not offered here should be acknowledged and rewarded as appropriate. Similarly, answers which do not include all the ideas or approaches suggested here may still be very good answers.

Of course, some of the points listed below will appear in weaker papers, but are unlikely to be developed.
The following elements are particularly relevant to criteria A, B and C

Question 1. (a) Poem

This poem offers a range of possibilities for interpretation, but an essential understanding of the nature of the speakers in the poem must be grasped in order to achieve a 3 in A. Whether the speakers are identified as "the house and its parts" or there is an attempt to identify all of the voices, at least a few need to be identified plausibly. Interpretations which name a child, or a statue, or the couple, for instance, as the speaker cannot achieve a 3.

Satisfactory and good papers, three to four, on a spectrum of increasing precision and detail, may:

- show some understanding of the nature of the "speakers" (mirror, clock, for example)
- discuss the situation in the house and the individuals who have left
- comment on the stanzic structure of the poem and its relation to meaning
- consider the use and effects of some poetic techniques.

Very good and excellent papers, four to five, on a spectrum of increasing sophistication and literary sensibility, may also:

- identify more clearly the individual speakers, their qualities, and points they make
- analyse in more depth the presentation of the previous inhabitants of the house, their relationship, and their relationship with the objects
- convey a sense of the cumulative effect of the poetic techniques and their role in building the meaning of the poem.

Question 1. (b) Prose

N.B. An ellipsis has been added to indicate an omission. If candidates comment on this ellipsis, credit should be given for any reasonable interpretation.

When marking scripts on this passage, examiners need to take care not to reward paraphrase which looks like interpretation.

Satisfactory and good papers, three to four, on a spectrum of increasing precision and detail, may:

- comment on the setting, noting the nature of the physical surroundings and the narrator's perception of them
- explore the nature of the situation in which the narrator finds himself and consider how this is conveyed
- show an awareness of the narrative stance
- discuss the suspenseful nature of the mood of the passage and how word choice and detail are used to create tension.

Very good and excellent papers, four to five, on a spectrum of increasing sophistication and literary sensibility, may also:

- examine more fully the narrator's situation, drawing into consideration his presentation of himself, his relationship with Ransom, the cottage itself
- analyse more fully the narrative stance, for example the narrator's internal monologue, direct address, self-questioning
- consider in some depth the structure of the passage
- comment more fully on stylistic elements, such as characterization, sentence structure, imagery, personification, for example.
Appendix 5: Some Examinations Boards and Assessment Institutes Internationally

In this section, we present brief write-ups on the structures and functions of leading Examination Boards around the world. Some of them are national examination boards; others are research agencies, etc. Some of the information may be 1–2 years old, however, the purpose is mainly to provide a glimpse of the range of functions these organisations do:
- Singapore Examinations and Assessment Board (SEAB), Singapore
- Cito, Netherlands
- Educational Testing Services, USA
- National Council of Teachers of Mathematics (NCTM), USA
- New Zealand Qualifications Authority, New Zealand

4.1

**Singapore Examinations and Assessment Board (SEAB), Singapore**

The Singapore Examinations and Assessment Board (SEAB) was earlier the Examinations Division of the Ministry of Education (MOE). It was formed as a statutory board in 2004 to develop and conduct national examinations in Singapore and to provide other examination and assessment services, locally as well as overseas.

SEAB’s key activities include:

1. **Assessments**
2. **Training and Consultancy**
3. **Research and Collaboration**

1. **Assessments:** SEAB carries out the following assessment activities in Singapore and abroad.
   - The Primary School Leaving Examination (PSLE)
   - The General Certificate of Education Normal, Ordinary and Advanced Level examinations (GCE N, O, and A-Level Examinations)
   - The International Primary School Examination (iPSLE) conducted in Indonesia and Vietnam for overseas students who apply for admissions to Singapore secondary schools

2. **Training and Consultancy:** SEAB provides a number of courses for teachers, private companies and other government boards that are involved in pedagogy and technical education. These courses include modules on basic statistics, testing theories, understanding assessment methods and practices, creating quality tests, developing scoring rubrics for performance assessment, carrying out action research, understanding computerized adaptive testing, developing standards for assuring the quality of examination papers and confidentiality and security for examination administration.

3. **Research and Collaboration:** SEAB collaborates with the University of Cambridge Local Examinations Syndicate (UCLES) to conduct the national GCE examinations. The Partner School Network initiated by SEAB strengthens the linkage between SEAB and schools. SEAB arranges for seminars for schools from private testing companies on topics related to assessments and developing thinking skills in students. Schools in turn provide SEAB with students to trial their assessments.
Cito is a Testing and Assessment Company based in the Netherlands. Cito was founded in 1968 by the Dutch government as a national institute for educational measurement, but has been fully privatised since 1999. Cito’s key activities include:

1. Assessment and Evaluation
2. Training
3. Research and Development
4. Consultancy

1. Assessment and Evaluation: CITO carries out the following assessment activities in Netherlands:
   - The National Assessments of Primary Education, commissioned by the Dutch government and conducted every five years to assess the quality of student education in terms of what students know.
   - The End of Primary School Test, which provides pupils, parents, and teachers with an objective report on the pupils' level of achievement.
   - The National Final Examinations for Secondary Level, also commissioned by the Dutch Government. The tests are prepared by a team of teachers which is chaired by a Cito expert, thus ensuring that the examinations are in touch with educational reality, yet developed in accordance with test-related requirements.
   - The School-based Examinations are products developed by Cito and used optionally by Dutch schools.

2. Training: The training arm of Cito offers courses on a variety of assessment issues such as test construction, psychometric analysis of test data, item development, understanding classical and modern testing theories, development of student monitoring systems, orientation to computer-based tests, administration of tests, examination audits and personal certification.

3. Research and Development: The research group of Cito has its centre for psychometric research. This centre is responsible for the psychometric quality of tests, examinations and other assessment procedures developed by Cito. The centre also focuses on issues related to development of psychometric models and software, procedures for computerised adaptive testing, automated test construction, and techniques for linking tests and examinations.

4. Consultancy: Cito provides consultancy for the examination and assessment centres of ministries in about 30 countries. Cito gives advice on the development of test and exam organisations, capacity building, implementation of test and exam instruments, and educational policy issues in these projects.
ETS was founded in 1947 after the American Council on Education, the Carnegie Foundation for the Advancement of Teaching, and the College Entrance Examination Board turned over their testing programs, a portion of their assets, and some of their employees to form ETS - a single national organization devoted exclusively to educational testing and research.

ETS is a private, non-profit organization devoted to educational measurement and research, primarily through testing. ETS is headquartered in New Jersey, USA and has offices in California, Florida, Puerto Rico, Texas, and Washington, D.C. The for-profit subsidiaries of ETS include Prometric, headquartered in USA and ETS Global BV, headquartered in Netherlands.

ETS’s activities and products fall into five broad areas of expertise:

1. Research, Assessment Development,
2. Test Administration and Test Scoring,
3. Instructional Products and Services.

1. Research and Assessment Development: ETS develops tests such as SAT, GRE, TOEFL, TOEIC, TSE, NAEP, etc. The research activities undertaken by ETS also assure the validity and fairness of ETS-developed products and services. The division also conducts research in topics related to English language learning assessment, automated essay scoring, policy issues related to classroom and end-of-course assessments, teacher quality, school leadership, and addressing the achievement gap.

2. Test Administration and Test Scoring: ETS tests are administered as paper pencil tests, computer based tests and internet based tests. ETS also offers test scoring services and has online test scoring network to enable users to develop their own scoring rubrics.

3. Instructional Products and Services: ETS provides a professional development products and services that assess and advance good teaching and school leadership. ETS provides formative and Web-based student data management, professional development, and consulting services to K-12 schools and districts.

Prometric and ETS Global BV provides test development, test delivery and data management capabilities for TOEFL, GRE and Praxis tests. ETS’s global subsidiaries make ETS research, products and services available to organizations worldwide.

4.4

The National Council of Teachers of Mathematics (NCTM) is an organization dedicated to improving the teaching and learning of mathematics from pre-kindergarten through high school. NCTM is a non-profit, non-partisan education association with nearly 100,000 members and 250 affiliates in the United States and Canada. NCTM was founded in 1920.
NCTM’s mission is to ensure the highest-quality mathematics education for all students. NCTM serves mathematics teachers in grades pre-K-12, teacher educators, pre-service teachers, institutions, and anyone who has an interest in the teaching of mathematics. NCTM members all work toward the same goal—improving the teaching and learning of mathematics for all students. NCTM offers memberships for a fee for individuals, schools, and organizations.

Some of the activities of NCTM are:

1. Development of Standards
2. Professional Development of teachers through workshops and conferences
3. Publishing Journals and Books
4. Providing Lessons and Resources to Teachers

1. Development of Standards: Since the federal government of the United States has no constitutional or legislative mandate for a national curriculum (as is the case in most other countries), education is a function of the individual states. NCTM first developed Standards for mathematics in 1989 in the hope that states would use them to guide their state mathematics frameworks. Adopting the NCTM Standards is completely voluntary. Practically all states base their state mathematics frameworks and benchmarks on the NCTM Standards. NCTM has many resources available to support the Standards.

2. Professional Development of Teachers through Workshops and Conferences: The NCTM Academy for Professional Development offers two- and five-day Institutes throughout the United States that are hands-on and designed to provide understanding and application of Principles and Standards. NCTM also offers workshops.

3. Publishing Journals and Books: NCTM publishes the journal for Research in Mathematics Education. ‘Navigations’ is a series of grade-band books that contain practical, teacher-tested activities and materials.

4. Providing Lessons and Resources to Teachers: The ‘Illuminations’ web site of NCTM offers Standards-based lesson plans, including interactive applets for students to explore, learn, and apply mathematics. ‘E-Standards’ is the electronic version of Principles and Standards. NCTM also supports research and advocacy on Mathematics Education.

4.5

**National Council of Teachers of Mathematics (NCTM), USA**

The New Zealand Qualifications Authority is a Crown entity established under the Education Act, 1989. The Qualifications Authority is accountable to Parliament through the Minister of Education and the Education and Science Select Committee. Approximately half the Qualifications Authority’s funding comes from Central government and the other half from fees and levies. The New Zealand Qualifications Authority’s primary function is to coordinate the administration and quality assurance of national qualifications in New Zealand.

The overall role of the New Zealand Qualifications Authority is to be the independent, and impartial expert organisation, which can be relied upon to administer robust National Qualifications Framework assessment systems and provide reliable quality assurance systems that deliver on our statutory accountabilities. This is in order that New Zealand
Qualifications are accepted as credible and robust, nationally and internationally. NZQA seeks to do this through operational excellence and clarity of purpose.

The key activities of NZQA include:
1. registering and monitoring all national qualifications on the National Qualifications Framework
2. conducting national senior secondary school examinations
3. registering and monitoring private providers of education and training to ensure they meet quality standards
4. administering a qualifications recognition service for overseas people wanting to live, work or study in New Zealand

1. National Qualifications Framework: The National Qualifications Framework (NQF) is designed to provide nationally recognised standards and qualifications. It also offers recognition and credit for a wide range of knowledge and skills.

2. The National Certificate of Educational Achievement (NCEA): This is the main national qualification for secondary students. Students are assessed for NCEA by a combination of external and internal assessments. Specialists are contracted by NZQA to write examination papers. All papers go through a series of checks to ensure they are error-free, aligned to the Standard being assessed, easily understood, and so on.

When candidate scripts are ready to be marked, they go through a similar process. Trained contractors mark scripts, and samples of their work are checked, so they can adjust the way they are marking if necessary. Students may be able to study toward qualifications other than NCEA while they are at school. These may be instead of NCEA, or as well NCEA.

The Qualifications Authority approves all degrees offered outside the university sector. NZQA also administers the trade and business qualifications.
Gujarat State Board Examination Reform